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THE LARYNGOSCOPE.

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No. 10

REVIEW OF THE AVAILABLE LITERATURE ON THE PHARYNX AND PHARYNGEAL SURGERY FOR 1947.*

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ANATOMY.

Keleman¹ made an extensive study of serial sections on the heads of 40 young rats. In the course of these examinations it was discovered that a communication frequently exists between the right and left halves of the nasal cavity at the choanal end of the respiratory part. The article is amply illustrated with sections of the nasal region and a free discussion conveys to the reader the anatomic peculiarities. It represents much work and keen observation, but from a practical point of view few rhinologists will take time to read it.

In recent years the literature has been replete with references to the postnasal space. This area has been variously referred to as the nasopharynx, the epipharynx or the pars nasalis of the pharynx. Gidoll² expresses the opinion that with such a varied nomenclature there is likelihood of an erroneous conception of this area; for this reason he describes the anatomy, anatomic boundaries and contents of the nasopharynx so that there can be no doubt as to the space under discussion. The histology and physiology of the nasal mucosa

*This review does not cover all articles for 1947 and the indexes of Index Medicines and Current List for 1947 are not complete. We have included as many 1947 articles as we could find.

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is discussed and the various symptoms referable to this area are enumerated. The numerous pathologic conditions encountered in the nasopharynx are considered at length; among these, Gidoll describes the superior surface of the soft palate as being covered with ciliated epithelium which is a continuation of the membranes of the nasal chambers, thus facilitating the downward sweep into the oral pharynx of that part of the mucous sheet which may happen to be on the nasal floor. Frequently, the soft palate is in such proximity to the posterior wall that the two may often be in actual contact; this permits transfer of secretions from the superior surface of the soft palate onto the posterior pharyngeal wall; however, the latter is covered with stratified nonciliated epithelium and secretions deposited in this region must be physically removed by hawking and clearing of the throat. Gidoll describes succeeding pathologic lesions of much importance, and discusses the problem of diagnosis and therapy. He quotes generously from men who have written authoritatively on this subject, thereby presenting not only his opinion but theirs as well. Emphasis is placed on the hitherto neglected nasal surface of the soft palate with reference to its rôle in chronic granular nasopharyngitis and postnasal discharge.

This is an excellent article on the postnasal space which is well worth reading by all interested in nasopharyngeal symptoms and it is regretted that space prevents quoting more liberally from it.

In an investigation of the thyroid gland in adult mice, Gorbman² discovered a duct extending between the right lateral pyriform fossa and the cranial end of the right thyroid in a normal adult female. He concluded that the ultimobranchial body may form thyroid structures which persist in the adult, and that at least some of these are physiologically as well as morphologically distinguishable from medially derived thyroid tissue.

BACTERIOLOGY.

Smillie and Duerschner⁴ made bacteriologic studies of lungs obtained from 207 autopsies. Of these, terminal broncho-

pneumonia was the diagnosis in 109 cases, and 98 cases with no diagnosis of pneumonia served as controls. Pneumococci, influenza bacilli and beta type hemolytic streptococci were of greatest potential danger in the production of terminal bronchopneumonia. In those autopsies in which bronchopneumonia was encountered, and in which any one of these organisms was present in the nasopharynx, a homologous organism was found in the lungs of eight of 10 instances. In a considerable number of the controls, one or the other of these potential pathogens was found in the lungs. At least half of these observations may be explained on the basis that the individual had died suddenly so that there was not sufficient time for development of pneumonia. Most of the remainder had been given considerable sulfadiazine or penicillin, which may explain the presence of a pathogen in the lungs without a typical picture of terminal pneumonia. This suggests that specific therapy may be of great value in checking the development of bronchopneumonia in a person who is suffering from debilitating illness.

PATHOLOGY.

In an effort to observe the changes brought about in the pharynx of persons smoking cigarettes treated with glycerol and diethylene-glycol, Andrews and associates⁵ utilized the colorimeter employing a photo (Type 929) and a meter for measuring the current of the photo tube. The equipment was essentially the same as that used by Kopetzky and Hirschfeld* in their studies on a similar problem, with improvement in apparatus and technique.

Seven hundred seventy-four readings were made on the pharynges of 31 subjects following the smoking of glycerine treated cigarettes and diethylene-glycol treated cigarettes. No significant difference in pharyngeal changes resulted from the smoking of the two types of cigarettes. A definite blanching effect was noted after the smoking of either type of cigarette. It was believed that blanching of the pharyngeal mucosa was indicative of the effect of nicotine on the peripheral vascular

*Kopetzky, S. J., and Hirschfeld, H.: Testimony before FTC, Docket No. 4794, p. 1641 and following.

system and that any irritating effects attributable to smoke must have been masked by the vasoconstriction of the blood vessels in the postpharyngeal wall. Possible complications in making reading may have been introduced due to changes in the film of mucus on the pharynx after smoking. No correlation was found between numbers of cigarettes normally smoked per day by the subjects and pharyngeal changes observed in the test.

Bordley,⁶ discussing the rôle of the pharyngeal tonsil and the nasopharynx in certain pathologic processes in children, points out that this area is often the cesspool harboring infection and stimulating the inflammatory reaction responsible for the wet cough hanging on following a cold and for insidious progressive deafness. He advocates adenoidectomy followed by radium application, or if adenoidectomy has been performed before, the use of radium alone.

DIAGNOSIS.

Rawlins⁷ suggests the use of suction to obtain secretions from the nasopharynx for cellular study in allergy in those patients whose secretions are too tenacious to produce adequate material by blowing the nose on wax paper. This method of obtaining secretions is described.

Watt⁸ has devised an infant pharyngoscope which can be attached to an otoscope to examine the larynx of an infant. Attention is called to the ease with which a rubber catheter can be inserted into the trachea. It would appear to offer nothing new to the profession.

DISEASES.

Brainina and Sorocheva⁹ made a study in 60 patients with phlegmonous angina to determine if paraffinotherapy is an aid to conservative treatment. Paraffinotherapy, beginning on the first to fifth day in the hospital, combined with conservative treatment, was given to 30 patients ranging in age from 15 to 55 years; 30 patients, used as controls, were given con-

servative therapy alone. Twelve patients were cured without surgical treatment in each group. The length of illness for the patients receiving paraffinotherapy was 13.4 days and for the controls 12.4 days; the stay in the hospital for the two groups was 7.9 and 5.4 days, respectively. The analgesic action of the paraffin was the only advantage noted.

Kravchenko¹⁰ reports the results of treatment with Bogomolets' serum in 120 patients with atrophic rhinopharyngitis and 86 with ozena. Improvement was noted in all of the patients with atrophic rhinopharyngitis. In the patients with ozena, 12 were greatly improved, 68 benefited and six showed no change. The only reaction noted was local skin hyperemia in a few cases, but this disappeared within 24 to 48 hours.

Ward and Walters¹¹ report their observations following experiments performed in an effort to determine whether poliomyelitis virus can be eliminated from the mouth. During the first three days of illness, 19 patients were requested to blow, cough and spit into sterile cloth masks, which were then tested for virus by monkey inoculation. The virus was found in the masks of two of the 19 patients. Ward and Walters believe that their study indicates that the virus can be eliminated from the mouth by blowing, coughing or spitting.

Pharyngologists are frequently called upon to examine and treat ulcerations of the pharynx and of the buccal cavity. On many occasions these ulcerations are but early manifestations of other diseases. Two cases of ulceration of the pharynx treated with penicillin are reported by Aboulker and associates.¹² Within three days following the administration of penicillin in the first case there was considerable improvement; however, in spite of 700,000 units, there was further breaking down of the ulcerations, rapid deterioration and death. In the other case, a patient with Vincent's angina and extensive ulcerations which did not respond to the arsenicals, penicillin therapy produced excellent results.

An unusual reaction consisting of glossodynia, exfoliation of the filaments of the filiform papillae and edema of the tongue following the administration of penicillin on three

separate occasions is reported by Brown.¹³ The penicillin was given orally by local application during three separate attacks of pharyngitis. Discoloration and hardening of the filaments of the filiform papillae of the tongue as well as edema of the tongue appeared and the patient experienced a burning sensation of the tongue and pharynx. After three or four days, denudation of all the filaments of filiform papillae occurred, leaving a smooth, edematous, hyperemic, tender tongue with central fissure and marginal indentations of the teeth. Following discontinuance of penicillin, there was a return to normal within two to three weeks.

An analysis of 54 cases of exudative pharyngotonsillitis of bacteroserologically proved beta hemolytic streptococcal origin and 125 cases of similar infection of unknown cause studied by like methods was made by Dingle and associates.¹⁴ They noted that streptococcal infection of the throat tends to have an acute onset with sore throat and systemic symptoms, high fever of short duration, diffuse redness and edema of oral pharyngeal mucous membrane, discrete or confluent exudate usually confined to the tonsils, enlarged and tender cervical lymph nodes, and moderate (average total leucocyte count of 13,427) leucocytosis.

Their study revealed that nonstreptococcal exudative tonsillitis and pharyngitis are generally milder diseases. There is a gradual onset with lower respiratory tract involvement. Fever is present but does not reach the levels of that of streptococcal pharyngotonsillitis. Leucocytosis is not a prominent feature. The exudate is pinpoint in character and is confined to the postpharyngeal wall rather than to the faucial tonsil. There is little evidence of cervical lymphadenopathy.

Dingle and associates evolved the following criteria for ruling out the hemolytic streptococcus as the etiologic agent in cases of exudative pharyngotonsillitis: 1. multiple throat culture yielding no hemolytic streptococci, and 2. failure to demonstrate serum antibodies to hemolytic streptococci. Emphasis is placed upon the reliability of cultural and serologic methods in the differential diagnosis of exudative tonsillitis

and pharyngitis of unknown origin and similar infections of streptococcal origin.

In a clinicopathologic conference conducted by Baker and McLester¹⁵ an interesting report is presented of a patient in whom sensitivity developed after taking one of the sulfonamides for a sore throat. In spite of the development of symptoms indicating sensitivity to the drug, the patient continued to take the drug for three days. His condition rapidly became worse, terminating with anuria, generalized clonic convulsions, cyanosis and death. Among other findings, a diagnosis of necrotizing pharyngitis was made.

Hollender,¹⁶ in a study of 140 specimens of nasopharynxes obtained at autopsy, reports 10 cases of Thornwaldt's disease, 18 cases of tuberculosis of the nasopharynx, one case of carcinoma of the nasopharynx and common occurrence of hyperplasia of some part of Waldeyer's ring. Attention is called to the comparatively frequent occurrence of Thornwaldt's disease, tuberculosis and neoplasm of the nasopharynx. The importance of the nasopharynx as a site for focal infection is stressed. Careful examination of the nasopharynx, including anterior and posterior rhinoscopy, palpation and nasopharyngoscopy through the nasoendoscope, is essential if a complete survey of the patient is to be obtained.

The report of an interesting case of typhoid fever occurring in an 11-year-old girl is presented by Huguenin and Sudaka.¹⁷ After a rather stormy period there seemed to be definite improvement in her general condition, but on the twentieth day she complained of difficulty in deglutition and it was observed that fluids were regurgitated through the nasal passages. The entire left side of the pharynx was completely paralyzed. The left half of the soft palate was flaccid and the uvula was pulled to the opposite side. The voice was nasal in character and the left vocal cord was fixed in adduction. This paralysis rapidly disappeared under medication with strychnine and vitamin B and at the expiration of one month all symptoms had disappeared.

Bertoin¹⁸ reports the case of localization of Löffler bacillus

in the posterior nares in a 35-year-old woman. The clinical picture resembled that of diphtheria: an infectious condition without any signs of toxicity, absence of false membranes in the nose, uvular edema of the pharynx, which was only congested and contained a necrotic scab on its posterior aspect, and total absence of cervical adenopathy. The patient complained of snuffling, dysphagia and pain localized in the posterior nares. A voluminous coat of gelatinous aspect, which must have obstructed the cavum and which was similar to that found in the nasal cavities of patients suffering from fibrinous rhinitis, was obtained when a finger was introduced behind the velum. The prognosis in this condition is the same as in diphtheria.

DIVERTICULA.

O'Connell¹⁹ reports a case of a huge esophageal diverticulum extending into the chest. Esophagoscopy revealed the distance from the incisor teeth to the base of the diverticulum to be 11 inches. Because of the size of the sac, a two-stage rather than a one-stage procedure was undertaken to remove it. At operation the lower and anterior surfaces of the diverticulum were found to be attached to the great vessels in the thorax, so that careful sharp dissection was necessary to free it. Removal of the sac from the thorax left a large smooth-lined cavity which was lightly packed with gauze. At a second operation the sac was excised and the wound closed; the patient made an uneventful recovery.

O'Connell believes that in spite of the recent trend to repair esophageal diverticula by a one-stage procedure, there is still a place for the two-stage operation, particularly in cases of large diverticula in which removal of the sac will leave a large cavity.

Sweet²⁰ calls to our attention the fact that for many years there has been a division of opinion among surgeons concerning the surgical technique to be used for excision of diverticula of the pharyngoesophageal junction. A review of the technical details of the earlier one-stage operation reveals the

reason for difficulties encountered. The objections to the two-stage method are longer hospitalization and the occasional development of a fistula. The technical principles of the one-stage method are discussed and much importance is attributed to the "do's and don'ts" when dealing with esophageal tissue, which are enumerated in detail. Meticulous attention should be given to excision of the neck of the diverticulum and the success obtained is attributed to an accurate method of suturing the edges of the cut esophagus. Five cases performed by the one-stage method are reported and because of the excellent results obtained and the absence of complications, Sweet believes it is worthy of continued trial.

This is an excellent but all too brief discussion of an interesting esophageal problem. With the prophylactic use of penicillin and sulfadiazine, there is reasonable safety in using the one-stage technique. The one-stage technique has been employed in four cases by us with gratifying results.

McNealy and Glassman,²¹ in describing a one-stage procedure for pharyngoesophageal diverticulectomy, call attention to the importance of careful preoperative preparation to rectify the poor nourishment of these patients and advocate postoperative parenteral and Levine's tube feeding for eight to 10 days, stating that early swallowing of food increases the likelihood of development of fistulous tracts. They warn against crushing the neck of the sac between clamps prior to separation and the use of continuous sutures for closing the defect because crushed devitalized tissue weakens the suture line and retards healing, and continuous sutures tend to narrow the esophageal lumen and potentially weaken the suture line.

These authors advocate separation of the sac proximal to serially applied clamps, each defect being closed as it is created with carefully spaced interrupted sutures until the entire diverticulum has been separated; this obviates the inclusion of devitalized tissue in the line of closure. The muscle fibres of the cricopharyngeus and the uppermost fibres of the esophagus are then drawn over the first suture line with inter-

rupted sutures. A soft rubber drain is inserted to the lateral margin of the thyroid gland. McNealy and Glassman warn that insertion of this drain down to the suture line will weaken the line of closure.

FOREIGN BODY.

Lowis²² presents a case which embodies both a moral and an admonition to all fishermen. The history is that a Malay fisherman, by having his mouth open at the wrong time, allowed part of his catch to jump therein and become lodged in his pharynx, head down. The trauma to the posterior pharyngeal wall, due to the extended dorsal fin, coincident with attempted removal, produced sufficient edema to necessitate tracheotomy. Then, under general anesthesia and by a process of bipolar version, the fish was turned from breech to vertex and successfully delivered.

HEMORRHAGE.

Potter²³ reports an interesting case in which a bullet entered the right frontal lobe of the brain, shattered the frontal sinuses and the right eye, passed down through the right antrum, fractured the right ascending ramus of the mandible, and lodged in the right side of the pharynx. Forty-eight hours following injury the wound was debrided, the dura repaired, and the mandibular fracture wired. Sixteen days after injury there was severe arterial bleeding from the mouth, which ceased on compression of the right common carotid. Shortly after ligation of the right common and external carotid arteries left hemiparesis appeared. Twenty-five days later, severe hemorrhage again occurred; the bifurcation of the right common carotid artery was exposed and the right common, external, and internal carotid arteries, as well as the superior thyroid artery, were divided between ligatures. Three days later the patient again had a brisk hemorrhage and was again operated upon; this time the internal carotid artery was ligated within the cranial cavity at its junction with the right posterior communicating artery. At this operation the bullet was also removed from the pharynx. Fifteen days later there was

another episode of hemorrhage, followed the next day by even more severe bleeding which was controlled by packing a tooth socket. Following this, the patient made a complete recovery.

This case is interesting because, in spite of multiple ligations, which seemingly would completely cut off all major arterial communication from the area, the patient continued to experience severe arterial hemorrhage.

Dwyer²⁴ reports the results in 60 cases of nasal and pharyngeal hemorrhage treated by oxidized cellulose. The series included 57 cases of epistaxis, two cases of post-tonsillectomy hemorrhage, and one case of postoperative bleeding following removal of heavy bony exostoses from the maxilla in a patient with Paget's disease. All patients had previously been treated by one or more of the well known methods such as epinephrine packs, hydrogen peroxide, silver nitrate and actual cautery. Oxidized cellulose was used only if the hemorrhage could not be controlled by one of these methods.

Complete and rapid cessation was obtained in 52 cases, rapid but temporary cessation in six cases, and failure in two cases. The six cases in which cessation was rapid but temporary were cases of blood dyscrasia and the results can be attributed to the poor general condition of the patients. The two failures occurred in the two adults following tonsillectomy and failure was due to poor accessibility to the bleeding areas and lack of pliability of the gauze, making it difficult to apply it directly to the bleeding area.

Dwyer considers ease of application and prompt action the chief advantages of oxidized cellulose.

RADIATION THERAPY.

Gorlia²⁵ reports the results in 65 patients with excessive lymphoid tissue in the nasopharynx treated by the application of radium. An applicator containing 50 mg. of radium filtered by 0.3 mm. of monel metal was employed. Standard dosage, modified as indicated, depending on such factors as the patient's age and extent of nasopharyngeal infection, was

used. This consisted of five-minute applications to each side for the first treatment, four-minute applications to each side after three months and again after nine months.

Of 20 patients who received their first treatment in November, 1946, and 19 in February, 1947, three were not traced. Definite improvement in nasal respiration was noted in all others except two, who had no respiratory difficulties. Patients whose deafness was the result of chronic catarrh of the Eustachian tubes reported definite improvement in hearing after treatment. The frequency of recurrences was reduced in most cases in which there were recurrent attacks of tubal catarrh and congestive otitis, and this often improved the deafness. Hearing improved considerably in cases in which the difficulty was caused from tubal catarrh associated with adenoids. Hearing was unimproved in two cases, but nasal respiration was definitely improved in one of these. Since catheterization of the Eustachian tube failed to produce temporary improvement in both of these cases, radium therapy was apparently not indicated. No untoward reactions to treatment were noted.

Careful nasopharyngeal examinations have consistently confirmed the observation that infection of the nasopharyngeal lymphoid tissue is an important factor in diseases of the respiratory tract and the ear. Proctor²⁶ states that repeated infections of the upper respiratory tract have their beginning in the nasopharynx. The beneficial results obtained after elimination of infected adenoids have consistently confirmed this observation. Proctor treated 400 patients with nasopharyngeal disorders by the application of radium. A total of 1,110 radium treatments was given these patients and the results were studied under two headings: 1. changes in nasopharyngeal tissue, and 2. changes in symptoms.

Radium applications, together with adenoidectomy when needed, were responsible for the elimination of nasopharyngeal lymphoid tissue in the vast majority of cases and many of the symptoms, such as colds and impaired hearing, were considerably relieved. The technique and indications for the

use of radium in the nasopharyngeal space are discussed, and Proctor believes that this type of therapy has considerable merit.

Rossitto²⁷ advocates the use of Roentgen ray in the treatment of chronically infected tonsillar and pharyngeal lymphoid tissue, with or without previous tonsillectomy and adenoidectomy. He believes that this type of treatment is indicated in the presence of persistent cough, recurrent tonsillitis and sore throat, cervical adenitis, gagging and vomiting, mouth breathing with nasal obstruction, ear disturbances and some forms of asthma. In such cases he has had no less than 90 per cent good results with Roentgen therapy. Because of the low dosage and the long interval between treatments, the method is considered safe. Four to six treatments are given at five to 14-day intervals, 60 to 90 r being given to the cervical and tonsillar areas, and 85 to 110 r to the nasopharyngeal area.

While in military service, McMurray²⁸ observed that 50 per cent of all disabilities in flying personnel resulted from aerotitis. An irradiation clinic was organized and all flying personnel was studied carefully. Over 4,000 nasopharyngoscopic examinations were done and interesting observations were noted as regards adenoid surgery. In many cases there was a recurrence of adenoid tissue, or the formation of much scar tissue, and the most glaring fault was that too often the torus tubarius had been removed with resulting scar tissue which reduced the Eustachian opening to a mere slit. This latter group gave a history of frequent otitis infections. The technique employed in the service is described and the beneficial effects of the use of radium are enumerated.

In an interesting article, Bordley²⁹ states that he is convinced of the efficacy of irradiation of the nasopharynx with radium in that type of conductive deafness due to obstruction of the pharyngeal end of the Eustachian tube by lymphoid tissue. He correctly points out that it is not effective in the treatment of other forms of deafness and the results obtained are superior when treatment is instituted early. Conduction

deafness results from any condition which seriously interferes with the transmission of air-borne sound waves to the middle ear. The common causes of conduction deafness are lesions which interfere with normal movements of ear ossicles. Pathologically, there are three types of such lesions. The first is ankylosis of the footplate of the stapes by otosclerosis; the second is extensive fibrosis of the mucosa of the middle ear. Both of these lesions represent irreversible processes. The third lesion, representing early tubal obstruction, is reversible and can be treated by irradiation. Selection of patients presenting only this third type of lesion is discussed. Bordley further reminds us that radium emanations are employed in the nasopharynx to reduce the amount of lymphoid tissue and combat the chronic infections involving the pharyngeal end of the Eustachian tube. It is interesting to note that if chronic infection in this area is allowed to progress, it will soon act as a mechanical obstruction to proper drainage and aeration of the middle ear. The disease progresses and in time this obstruction of the tube builds up a negative pressure within the tympanic cavity and causes retraction of the tympanic membrane in addition to interference with the normal movements of the ossicles. Such conditions, if allowed to persist, lead to the formation of scar tissue and a permanent limitation of ossicular movement. The application of radium is considered and the efficacy of its results discussed. This is an excellent article for those interested in the prevention of deafness.

Ward and associates³⁰ conducted a carefully controlled experiment to evaluate the effectiveness of nasopharyngeal application of radium in alleviating asthma in children. The series consisted of 34 children from two to 14 years of age, all of whom had lymphoid tissue in the nasopharynx, and both intrinsic and extrinsic types of asthma were represented. Treatment consisted of 2 gm. minutes of radon to each side of the nasopharynx once each month for an average of four treatments. The period of observation ranged from six months to four years. Fifteen patients (44 per cent) were completely relieved of asthmatic attacks during the period of

observation. Five children (15 per cent) had only an occasional mild attack. Three children (9 per cent) showed moderate improvement. Thus, of the 34 patients, 68 per cent obtained from total to 50 per cent relief, whereas 32 per cent obtained no relief. Some benefit was noted in all types of asthma.

Crowe and Walzl³¹ reiterate the indications and method of treatment for irradiation of hyperplastic nasopharyngeal lymphoid tissue, using both radon and radium nasopharyngeal applicators. The effective action is upon the germinal centers producing changes in these cells which make impossible the replacement of the short-lived mature lymphocyte; thus, the lymphoid tissue mass gradually shrinks, as there is no replacement from the damaged germinal center. They call attention to the necessity of careful nasopharyngeal examination to determine the need for treatment and warn against the use of the applicator in the presence of an acute upper respiratory infection because of the danger of producing otitis media.

In conclusion, they "emphasize that the purpose of irradiation of the nasopharynx is simply to remove lymphoid tissue, and one can expect improvement of the condition to the extent that the adenoids are the offending agent, either by mechanical obstruction or chronic infection.

"When carefully used as an adjunct to surgery and antibiotics, it offers a powerful therapeutic aid."

Crowe³² again brings to attention the fact that many of the hearing disorders of adult life begin in childhood. It is pointed out that if we are to learn more about the causes, treatment and prevention of deafness, we must concentrate our studies on children presenting hypertrophic lymphoid tissue about the orifice of the Eustachian tube. In this way disability from deafness later in life can be reduced as much as 50 per cent.

Futch and Abby,³³ in discussing the use of the nasopharyngeal applicator, bring to attention the fact that recurrence of lymphoid tissue, particularly in individuals with the lymphoid diathesis, is so common that some recurrence is usual. In

their series of about 400 cases of irradiation of the nasopharynx, it was noted that six months to a year is the usual time of relief before there is some recurrence of lymphoid tissue; however, they did not note at the time of the report the recurrence of the primary deafness or of asthma in the patients who were improved by irradiation. They advocate further radiation at the time of recurrence.

Vaughan,³⁴ in advocating the use of Roentgen ray in treating infected or hypertrophied lymphoid tissue of Waldeyer's ring, believes that soon 90 per cent of infected throats will be treated by radiation. He states that the only infected tonsils which cannot be cured by this method are those which contain closed cysts or have a walled-off abscess. He advocates one treatment a week for five weeks, using 200 KV; 15MA 0.5 CU-IA, — 50 cm. distance. If results are not satisfactory at the end of two months, two more treatments are given.

OBSTRUCTION.

Adhesions of the soft palate to the pharyngeal wall may be congenital or acquired. Congenital atresia is due to arrested development in the early stages of the embryo, whereas acquired malformations are inflammatory, degenerative and traumatic. Vaughan³⁵ states that in former years a great deal of stress was placed on syphilis as a cause of nasopharyngeal atresia; however, improved methods of treatment have largely eliminated this factor. The main discomfort from nasopharyngeal atresia is inability to breathe through the nose and stagnation of secretions which can produce changes in the Eustachian tubes. Vaughan discusses the merits of the Mac-Kenty technique and then reports three cases in which the atresia was corrected. In two of the cases a silver plate was drawn into the nasopharynx after the adhesions had been freed and this silver plate was held in position by anchoring it to the columella. In the other case, Tiersch grafts were employed successfully.

STENOSIS.

In a review of 37 cases of cicatricial nasopharyngeal stenosis seen at the Mayo Clinic, Figi³⁶ observed that trauma during

tonsillectomy and adenoidectomy accounted for 54 per cent of the cases. Although syphilis is frequently considered to be the most common cause of cicatricial stenosis of the nasopharynx, Figi found only 22 per cent of his series to be of syphilitic etiology. Unknown inflammatory processes, rhinoscleroma, caustic burns due to sulphuric acid, diphtheria, lupus and attempted surgical correction of congenital throat malformations were causal factors in the remaining cases.

An excellent review of the past and present methods of correction for cicatricial stenosis of the nasopharynx is presented. A patient with syphilitic nasopharyngeal stenosis treated by division of the cicatrix and insertion of a skin graft wrapped around a sponge rubber mold, through which two rubber tubes had been inserted for nasal breathing, is reported. The stent was held in place by carrying attached silk sutures through both nasal cavities, the free ends being tied below the columella. The edges of the palate and pharyngeal incision were sutured to the graft. After 10 days, the graft had taken completely. A self-retaining obturator of acrylic (vernonite) was then inserted and worn for approximately two weeks. Although the speech was nasal and nasal fluid was regurgitated during swallowing for some time, this later improved considerably.

BENIGN GROWTHS.

In a general discussion of congenital cysts of the tongue, floor of the mouth, pharynx and larynx, New³⁷ describes ranula, dermoid cyst, cystic hygroma, aberrant thyroglossal cyst of the tongue or the floor of the mouth, branchial cyst of the pharynx and laryngeal cyst.

Ranula, which is a term usually applied to any cyst of the anterior part of the floor of the mouth, should be used only to designate the thin-walled, epithelial-lined, sometimes bluish-tinged, soft and easily compressible cyst which grows slowly. It can be distinguished from the dermoid cyst by the thinness of its walls. The treatment of choice is complete removal of the cyst. The larger cysts may be opened and the lining destroyed by superficial diathermy.

Cystic hygroma is a multilocular, thin-walled endothelial-lined lymph cyst. It usually occurs primarily in the neck, but may involve the floor of the mouth. Lymphangioma of the floor of the mouth presents the same clinical appearance; microscopically, the two cannot be distinguished. Both respond well to irradiation or radon implantation, which is the treatment of choice.

Dermoid cysts involving the floor of the mouth and the submental and submaxillary regions may be situated either above or below the mylohyoid muscle or may extend from one region to the other through the muscle. The cysts are usually doughy to palpation and there may be a sinus present in the floor of the mouth or dorsum of the tongue through which the contents of the cyst may be discharged. Although most of these cysts in this region occur in the floor of the mouth, they may be present in the body of the tongue. They must be distinguished from enlargement of the sublingual and submaxillary glands and from salivary calculi. The treatment is complete removal and may be accomplished either through the floor of the mouth or submentally.

Thyroglossal cysts occur in the midline of the anteroposterior portion of the neck from the base of the tongue to the thyroid gland. They are lined with stratified or ciliated epithelium. If they become infected, they may cause repeated inflammatory swelling. Treatment consists of complete removal, preferably by the method of Sistrunk.

Branchial cysts may be present laterally in the pharynx in the region of the posterior tonsillar pillar or below the tonsil or in the hypopharynx and at the base of the tongue. New has never seen a cyst of this type produce any serious symptoms.

We are reminded by Brown³⁸ that nasopharyngeal fibromas are not malignant histologically but may become malignant clinically because of pressure or location. These types of tumors are relatively uncommon and occur predominately in adolescent males. Nasopharyngeal fibromas arise most commonly from the periosteum covering the base and anterior face of the sphenoid and basilar process of the sphenoid. The

gross and microscopic appearance of the tumor is described. Various surgical procedures are discussed in considerable detail. The transpalatine route is believed to offer the best opportunity for successful removal and three cases successfully removed by this method are reported.

MALIGNANT TUMORS.

Davis²⁹ presents an analysis of 33 cases of nasopharyngeal tumors, of which 19 were carcinoma, four lymphosarcoma, nine angiofibroma and one was a myxosarcoma. The commonest point of origin of carcinoma was the lateral nasopharyngeal wall. The first symptom usually refers to the Eustachian tube and ear. Early involvement of cervical nodes occurred in six of the 19 cases of carcinoma. In six cases the first symptom was headache, diplopia or VIth nerve paresis or paralysis. Neuralgia of the trigeminal nerve or upper cervical spinal nerve was less common. There was a tendency for VIth nerve paralysis to become bilateral, followed by ptosis, IIIrd nerve paralysis and, later, complete ophthalmoplegia on one side and partial on the other. It is stated that the growth may commence in the body or greater wing of the sphenoid bone and later burrow to the surface in the nasopharynx in patients having cranial nerve paralysis as the first symptom. A superficial lymphatic along the posterior border of the sternomastoid muscle may become involved early.

Davis emphasizes the importance of careful inspection of the nasopharynx by all methods possible in the early diagnosis of nasopharyngeal neoplasm. The treatment of choice in malignancies of the nasopharynx is Roentgen irradiation, whereas that of fibromas is surgical removal.

Godtfredsen⁴⁰ reports 454 cases of malignant nasopharyngeal tumors, of which 38 per cent showed ophthalmoneurologic symptoms. Carcinoma and sarcoma comprised the histopathologic types of neoplasm encountered. Half of the patients were between 40 and 60 years of age. The condition occurred twice as often in males as in females.

Godtfredsen's analysis of cases demonstrated that ophthalmo-

neurologic symptoms occur early in the disease, often four to five months before the exact diagnosis is made. Although symptoms of trigeminal lesions predominated up to 11 months before the diagnosis was made, it was noted that the frequency of ophthalmic symptoms gradually outstripped those of trigeminal origin, until at the time the diagnosis was made, 75 per cent of the cases had ophthalmologic symptoms and 68 per cent had trigeminal symptoms. The early trigeminal symptom was maxillary pain of neuralgic type. The early ophthalmologic symptom was abducens paresis. Later, visual disturbances, exophthalmos or Horner's syndrome may develop, as well as neurologic and otologic symptoms and metastatic nodes. In many of the cases there was combined trigeminal ophthalmic involvement, probably due to neoplastic infiltration about the cavernous sinus. In a few cases, the third and fourth cranial nerves were involved. The same is true for the seventh, ninth and twelfth cranial nerves.

According to Godtfredsen, a cranial syndrome, composed of Vth nerve ophthalmoplegia, paresis of the twelfth cranial nerve and trigeminal neuralgia produced by the intracranial growth of the primary tumor and the lymphatic metastasis is pathognomonic.

Godtfredsen⁴¹ brings to attention, in two case reports, an extremely rare and not previously mentioned course run by malignant nasopharyngeal tumors. In both cases the presenting sign was enlargement in the parotid region and the primary site in the nasopharynx was not discovered in either case until after excision and microscopy. The importance, in cases of parotid tumors, of considering the possibility of a secondary tumor, in particular gland metastases from a primary nasopharyngeal tumor, is illustrated.

Imperatori⁴² reviews the literature and reports a case of chordoma of the cervical region. He states that these rare tumors are vestigial remnants of the notochord and are usually located in areas representing its extremities; namely, the spheno-occipital synchondrosis and the sacrococcygeal region. Rarely are they found in the cervical region.

These tumors should be considered when one is confronted with a slow-growing, tense, jelly-like tumor in the oropharynx or the laryngopharynx. The exact diagnosis cannot be made with biopsy. Cysts and retropharyngeal abscesses must be differentiated.

These tumors are Roentgen resistant and their anatomic situation is such that external surgical approach is difficult. Imperatori considers suspension laryngoscopy the method of choice for removal of these lesions when located between the third and sixth cervical vertebrae.

Malignancies occurring in the nasopharynx are comparatively rare and Hoover⁴³ states that during a 10-year period an average of 2.6 cases of nasopharyngeal malignancies were diagnosed each year. This means that for each case of malignant disease of the nasopharynx, 13,000 or more patients are seen. Godtfredsen estimated that one case occurred in 181,250 persons per year.

The symptomatology of nasopharyngeal tumors is discussed at length. Symptoms are varied and may be divided into a number of groups according to the early symptoms produced. A tumor may be present for a considerable length of time, remaining asymptomatic until its size forces recognition. Nasal and aural symptoms predominate in most cases, the details of which are well described by Hoover.

The diagnosis of nasopharyngeal tumors is best established by biopsy and microscopic examination. Visualization of the tumor by mirror or pharyngoscope is always desirable. Hoover cautions that in obtaining specimens for biopsy, the tissue should be removed from an area sufficiently deep to obtain tumor tissue. Roentgenologic study of the base of the skull may give valuable information.

The majority of malignant tumors occurring in the nasopharynx are poorly differentiated and are sensitive to radiation therapy; therefore, the treatment of choice in such tumors is deep radiation. If the diagnosis is made early and radiation therapy instituted immediately, promising results may be obtained.

Because of difference in activity of some tumors of the pharynx developing in different parts of the throat, Figi⁴⁴ considers these tumors in relation to their site of origin.

In the oropharynx the most common neoplasms are high grade squamous cell epitheliomas or lymphosarcomas, whereas adenocarcinomas and fibrosarcomas occur less frequently. Tumors of the first two types are highly active and metastasize early, whereas those of the latter two types grow more slowly.

The symptoms of malignancy in this location are present for only a short time, rarely more than a few weeks, and range from severe to entirely absent, the patient complaining of only mild soreness or discomfort, or he may have severe lancinating pain frequently referred to the ear on the involved side. As a rule, epitheliomas produce a good deal of pain. Lymphosarcomas and sarcomas of other types in this area are likely to be less painful. Adenocarcinomas commonly are symptomless until they attain considerable size.

The physical findings vary considerably; epitheliomas are not likely to be discovered until ulceration has developed. Lymphosarcomas usually produce diffuse unilateral enlargement of the tonsil, with varying degrees of inflammation, and early present the appearance of a chronic inflammatory process, and because of this are frequently treated as inflammatory lesions for considerable periods of time. Fibrosarcomas may present a similar appearance, but are less likely to involve the tonsil and often are firmer and more localized.

Adenocarcinoma of the mixed tumor type is usually painless, firm or hard, frequently nodular, well encapsulated, and usually symptoms have been present for a long time, often several years.

Treatment consists of electrocoagulation supplemented with local radon for early epitheliomas, to be followed by external radiation or dissection of nodes, depending on the activity of the malignant process. In general, radiation is preferable to surgical measures in most of these cases. Lymphosarcoma of

the pharynx should always be treated by radiation. Because adenocarcinomas of the mixed tumor type are encapsulated, they should be removed surgically when feasible.

Tumors of the nasopharynx are chiefly highly malignant squamous cell epitheliomas or lymphosarcomas and originate most commonly in the fossa of Rosenmüller. They produce a characteristic symptom complex consisting of 1. deep seated frontal temporal or parietal pain, worse at night, 2. symptoms referable to the ear, 3. involvement of second, third, fifth, sixth, ninth, tenth and twelfth cranial nerves and cervical sympathetic trunk, and 4. presence of metastatic masses in the neck. Because of their activity and relative inaccessibility, the treatment of choice is irradiation.

Neoplasms of the base of the tongue and hypopharynx are usually highly malignant squamous cell epitheliomas, lymphosarcomas or adenocarcinomas. Often they are well advanced before symptoms become severe enough to lead the patient to a physician. The treatment of choice consists of radon seed implantation early and, later, Roentgen therapy.

REFERENCES.

1. KELEMAN, G.: Junction of the Nasal Cavity and the Pharyngeal Tube in the Rat. *Arch. Otolaryngol.*, 45:159-168, Feb., 1947.
2. GIDOLL, S. H.: Clinical Significance of the Postnasal Space. *Eye, Ear, Nose and Throat Month.*, 26:137-144, Mar., 1947.
3. GORBMAN, A.: Functional and Morphological Properties in the Thyroid Gland, Ultimobranchial Body and Persisting Ductus Pharyngo-branchialis IV of an Adult Mouse. *Anat. Rec.*, 98:93-99, May, 1947.
4. SMILLIE, W. G., and DUERSCHNER, DOROTHY: The Epidemiology of Terminal bronchopneumonia. II. The Selectivity of Nasopharyngeal Bacteria in Invasion of the Lungs. *Am. Jour. Hyg.*, 45:13-18, Jan., 1947.
5. ANDREWS, A. H., JR.; LENTH, C. W.; STAUNTON, J. J. J., and HOLINGER, P. H.: Changes in the Color of the Pharynx Following Smoking. *THE LARYNGOSCOPE*, 57:211-225, Mar., 1947.
6. BORDLEY, J. E.: The Nasopharynx. *Am. Jour. Dis. Child.*, 74:635-644, Nov., 1947.
7. RAWLINS, A. G.: A Method of Obtaining Secretions from Nasopharynx for Diagnosis of Nasal Allergy. *THE LARYNGOSCOPE*, 57:95-96, Jan., 1947.
8. WATTS, L. O.: An Infants' Pharyngoscope. *Brit. Med. Jour.*, 2:351, Aug. 30, 1947.
9. BRAININA, R. Y., and SOROCHOVA, S. M. Opyt Primeneniya Para-

fino terapii pri Flegmonoznykh Anginakh. *Vestnik Oto-Rino-Laringol.*, 1:43-47, 1947.

10. KRAYCHENKO, A. A.: Rezul'taty Lecheniya Atroficheskikh Rino-faringitov i Ozeny Antiretikularnoi Tsitotoksicheskoi Syvorotkoi Akademka Bogomol'tsa. *Vestnik Oto-Rino-Laringol.*, 1:28-30, 1947.

11. WARD, R., and WALTERS, B.: The Elimination of Poliomyelitis Virus from the Human Mouth or Nose. *Bull. Johns Hopkins Hosp.*, 80:98-106, Jan., 1947.

12. ABOULKER, H.; SITBON, J., MLE, MUTIN and MIGUERES: Ulcerations Necrotiques du Pharynx et Penicilline. *Algerie-Med.*, 3:50:250-251, Mar., 1947.

13. BROWN, R. L.: Glossodynia and Exfoliation of Papillae Filaments After Oral Administration of Penicillin. *Arch. Otolaryngol.*, 45:355-356, Mar., 1947.

14. DINGLE, J. H.; ABERNATHY, T. J., et al.: Exudative Tonsillitis and Pharyngitis of Unknown Cause. *Jour. A. M. A.*, 133:588-593, Mar. 1, 1947.

15. BAKER, R. D., and McLESTER, J. S.: Clinicopathological Conference. *Jour Med. Assn. Ala.*, 16:337-341, Apr., 1947.

16. HOLLENDER, A. R.: Some Commonly Unrecognized Diseases of the Nasopharynx: Results of Studies of 140 Autopsy Specimens. *South. Med. Jour.*, 40:248-252, Mar., 1947; also, *Eye, Ear, Nose and Throat Month.*, 26:382-384, July, 1947.

17. HUGUENIN, A., and SUDAKA, P.: Paralysie du Pharynx au Cours d'une Fièvre Typhoide. *Algerie-Med.*, 50:509-511, June-July, 1947.

18. BERTOIN, R.: Diphtheria Isolée du Nasopharynx. *Jour. de Med. de Lyon*, 28:683-685, Sept. 20, 1947.

19. O'CONNELL, T. C. J.: A Case of Pharyngeal Diverticulum. *Irish Jour. Med. Sci.*, pp. 179-181, 1947.

20. SWEET, R. H.: Pulsion Diverticulum of the Pharyngoesophageal Junction; Technique of the One-Stage Operation. *Ann. Surg.*, 125:41-48, Jan., 1947.

21. McNEALY, R. W., and GLASSMAN, J. A.: A One-Stage Pharyngoesophageal Diverticulectomy. *Surg.*, 21:470-475, Apr., 1947.

22. LOWIS, R. M. B.: A "Fishing" Story. *Brit. Med. Jour.*, 2:211, Aug. 9, 1947.

23. POTTER, J. M.: Cerebrofacial Bullet Wound Resulting in Five Secondary Hemorrhages from the Nasopharynx; Carotid Ligatures. *Brit. Jour., Surg., War Surg. Supp.*, 1:260-262, 1947.

24. DWYER, G. K.: Oxidized Cellulose in Nasal and Pharyngeal Hemorrhages. *Conn. State Med. Jour.*, 11:976-978, Dec., 1947.

25. GORLIA: Radium-Thérapie des Affections de l'Arrière-Nez. *Acta Oto-Rhino-Laryngol., Belg.*, 1:3:282-295, 1947.

26. PROCTOR, D. F.: Radiation Therapy for the Removal of Adenoid Tissue. *Arch. Otolaryngol.*, 45:40-47, Jan., 1947.

27. ROSSITTO, A. F.: Roentgen Treatment of the Tonsils and Postpharyngeal Lymphoid Tissues in Children. *Radiol.*, 48:118-123, Feb., 1947.

28. McMURRAY, J. S.: Radium Therapy to Nasopharynx for Peritubal Lymphoid Tissue. *Pa., Med. Jour.*, 50:606-607, Mar., 1947.

29. BORDLEY, J. E.: The Use of Radium in the Treatment of Conductive Deafness. *Surg., Gynec. and Obst.*, 84:839-844, Apr. 15, 1947.

30. WARD, A. T., JR.; LIVINGSTON, S., and MOFFAT, D. A.: Asthma in

Children; Treatment (of Lymphoid Tissue) with Radium (Radon) Nasopharyngeal Applicator. *Jour. A. M. A.*, 133:1060-1062, Apr. 12, 1947.

31. CROWE, S. J., and WALZL, E. M.: Irradiation of Hyperplastic Lymphoid Tissue in the Nasopharynx. *Jour. A. M. A.*, 134:124-127, May 10, 1947; also, *Miss. Val. Med. Jour.*, 69:117-120, July, 1947.

32. CROWE, S. J.: Irradiation of the Nasopharynx. *Bull. Johns Hopkins Hosp.*, 80:297-298, May, 1947.

33. FUTCH, C. E., and AMBEY, J. D.: Irradiation of the Nasopharynx. *Med. Arts and Sci.*, 1:58-60, Oct., 1947.

34. VAUGHAN, J. H.: Radiation Treatment of Infected or Hypertrophied Lymphoid Tissue in the Throat and Nasopharynx. *Med. Times*, 75:320, Nov., 1947.

35. VAUGHAN, H. S.: Nasopharyngeal Atresia. *Plast. and Reconstruct. Surg.*, 1:309-316, Nov., 1946.

36. FIGI, F. A.: Cicatricial Stenosis of the Nasopharynx: Correction by Means of a Skin Graft. *Plast. and Reconstruct. Surg.*, 2:97-104, Mar., 1947.

37. NEW, G. B.: Congenital Cysts of the Tongue, the Floor of the Mouth, the Pharynx and the Larynx. *Arch. Otolaryngol.*, 45:145-158, Feb., 1947.

38. BROWN, J. M.: The Surgical Treatment of Nasopharyngeal Fibroma. *Ann. Otol., Rhinol. and Laryngol.*, 56:294-297, June, 1947.

39. DAVIS, E. D. D.: The Diagnosis and Treatment of Tumors of the Nasopharynx. *Proc. Roy. Soc. Med.*, 40:135-137, Jan., 1947.

40. GODTFREDSEN, E.: Ophthalmoneurological Symptoms in Malignant Nasopharyngeal Tumors. *Proc. Roy. Soc. Med.*, 40:131-135, Jan., 1947.

41. GODTFREDSEN, E.: Malignant Nasopharyngeal Tumors Manifesting Themselves as Parotid Tumors. *Acta Chir. Scand.*, 95:205-212, Jan., 1947.

42. IMPERATORI, C. J.: Chordomas of the Cervical Region. *Ann. Otol., Rhinol. and Laryngol.*, 56:271-280, June, 1947.

43. HOOVER, W. B.: Malignant Growths of the Nasopharynx with Particular Emphasis on Their Frequency, Symptomatology and Diagnoses. *S. Clin. N. Am.*, 27:577-581, June, 1947.

44. FIGI, F. A.: Malignant Tumors of the Pharynx and Larynx. *Wis. Med. Jour.*, 46:611-614, June, 1947.

SOUTH CAROLINA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

A joint meeting of the South Carolina Society of Ophthalmology and Otolaryngology and the North Carolina Eye, Ear, Nose and Throat Society was held in Charleston, S. C., Sept. 13-16, 1948. The Francis Marion Hotel was headquarters. The first two days were devoted to ophthalmology and the last two to otolaryngology. Four outstanding men had been secured in each of the above specialties.

**EXPERIMENTAL SINUS SURGERY:
SOME EXPERIMENTS ON VENTILATION
AND SINUSITIS.***

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Rhinologists have been taught that in the surgical treatment of sinusitis two ends are to be sought; namely, drainage and ventilation. Studies on drainage¹ indicate that gravity drainage is desirable and beneficial when a sinus is filled with secretion. A considerable amount may drain out through a properly placed and properly prepared window; however, if the amount of material to be drained is not great it will drain along the lines of normal ciliary flow without reference to gravity or any artificial window.

What about ventilation? Just what is implied in the term? If ventilation implies merely the passage of oxygen and nitrogen, it is difficult to see just what beneficial effects these gases could have in sinusitis or rhinitis. Certain bacteria are inhibited in their growth by oxygen, whereas certain others are favored. These two effects would probably about cancel one another. Presumably nitrogen is inert. A pumping action by the respired air is postulated by some, but it seems to me that such effect, if any, must be negligible at the velocity attained by respired air.

The question seemed to be worth some study, and it was, therefore, decided to study the effect of closing one nostril surgically in a number of rabbits, thereby doubling the ventilation (*i.e.*, passage of air) on one side and stopping it entirely on the other. This, of course, is not the same as closing a nose

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with infected secretion and inflammatory swelling, but it should give the effect of the one factor of air flow.

It has been learned in previous studies² that the sinuses of rabbits become filled with secretion, if the ostia are enlarged surgically, and that this secretion becomes infected in a large percentage thus treated. As a second step in this study, the ostia of both maxillary sinuses were enlarged equally for the purpose of determining if air flow has an effect in promoting or preventing this sinusitis.

Technique: The right nostril was closed surgically in each of six rabbits at the University of Minnesota with the help of Dr. Neill Goltz. The skin was undermined around the entire circle of the entrance to the nostril by passing a hemostat subcutaneously. This was done in two steps, since the forceps could not readily be passed more than half way around in one step. An annular incision of the skin was made just within the nostril by cutting along the undermining hemostat. In this way a cuff of skin became everted. The skin (or mucous membrane) remaining within the nostril was elevated and inverted as well as possible. Then the subcutaneous tissue was stitched across the lumen, closing it tightly. The everted skin cuff was tightly closed by means of mattress sutures. At the end of the operation the nostril had been eliminated and in its place was the elevated line of everted skin edges. A nostril closed in this manner seems to remain closed indefinitely.

After recovery following the first operation, the animals were removed to St. Luke's Hospital, at Duluth, where the experiments were completed. The operation upon the maxillary sinuses was done through an incision which ran parallel with the bridge of the nose in the cheek tissues, but as far posterior from the bridge as practicable. In case a subcutaneous abscess should form over one or both of the sinuses, it is desirable to have normal tissue along the bridge of the nose to prevent passage of the pus across the midline. The lateral wall of the maxillary sinus can be readily opened by means of a small rongeur and enough removed to expose the ostium to view. This was done on both sides, and then both ostia were cleanly and equally enlarged along the anterior lip by means

of a small knife and punch forceps. This procedure opens a window directly into the nasal space, and often also into another sinus which lies contiguous to the orbit. The resulting windows were carefully measured to make them as nearly as possible the same size. These windows remain open without difficulty because the sinus walls are so thin that no considerable annular scarring with stenosis occurs.

The removal of a small amount of ciliated epithelium at this vital portion of the ciliary mechanism seems to break the continuity of ciliary flow from a sinus, and secretion accumulates, which in the rabbit becomes readily infected.

Protocols: The right nostril was closed in all six rabbits during March and April, 1945. One died and was lost as far as the study was concerned. The fate of the other five was as follows:

All operations were done under intravenous seconal or pentothol sodium anesthesia with aseptic precautions.

Rabbit 1: Died from the anesthetic on Jan. 25, 1947, 21 months after closure of the right nostril. This animal serves as a control. The right nostril had remained closed for 21 months and both maxillary sinuses were clean and normal.

Rabbit 2: Found dead in its cage on April 23, 1946, 12 months after closure of the right nostril. At necropsy there was found to be a serous maxillary sinusitis on the right (closed side), and a purulent maxillary sinusitis on the left. The large sinus just anterior and inferior to the orbit on both the right and left sides contained pus.

Rabbit 3: Jan. 23, 1947, the animal was found to have rhinitis. It was sacrificed by injecting a lethal dose of pentothol sodium intravenously 21 months after closure of the right nostril. The maxillary sinus and the one next to the orbit were both found to be full of pus on both sides. There was no discernible difference in the infection on the closed side as compared with the open side.

Rabbit 4: Sept. 11, 1946, 17 months after closure of right nostril, both maxillary sinuses were opened, and the ostia

carefully enlarged by resecting a portion of the anterior lip of each. This was membranous on the right and bony on the left. When finished the right ostium measured 4 mm. in diameter and the left 5 mm. During the month following this operation, there was a little secretion in the left nostril from time to time. There was also some questionable swelling of the left cheek.

Oct. 12, 1946: The rabbit was sacrificed by a lethal dose of pentothol sodium injected intravenously—31 days after the operation upon the sinuses. The bridge of the nose was opened and the nasal cavities and maxillary sinuses inspected. The nasal cavities were empty and looked clean. Both maxillary sinuses contained a mucinous secretion. After fixing, the head was dissected further and it was found that both maxillary sinuses contained pus, as did both the orbital sinuses. There seemed to be more pus on the left (open side) than on the right side.

Rabbit 5: Twenty-three months after closure of the right nostril on March 14, 1947, both maxillary sinuses were opened through the cheek. The ostium in both sinuses was enlarged by resecting a portion of the anterior lip as nearly equally as possible. After being enlarged, each was crescentic in shape, the right measuring 9 x 4 mm. and the left measuring 8x4 mm. The nasal cavity could be seen through both of the enlarged ostia.

April 8, 1947, 25 days later, the animal was sacrificed by intravenous injection of a lethal dose of pentothal sodium. A subcutaneous abscess was found over the left maxillary sinus. The bridge of the nose was opened and both maxillary sinuses were found to be filled with pus. Both of the enlarged ostia were still widely patent, but both were round instead of crescentic in shape.

Comment: Five rabbits lived between one and two years with the right nostril closed. Twice the normal volume of air passed through the left nasal air passages during that time, and none at all through the right. No further surgical proce-

dure was done upon one animal and it was free of rhinitis at the time of death. The sinuses were normal on both sides.

The other four developed bilateral sinusitis: two spontaneously and two after equal surgical enlargement of the right and left maxillary ostia. One animal which was found dead showed greater involvement on the side of the open nostril (left). In the other three there was no striking differences between the two sides. One had an abscess overlying the left maxillary (open side), whereas there was none on the right side, and in one other there seemed to be more pus in the left sinus than in the right; but all four were suffering from bilateral sinusitis at the time of death.

One cannot draw conclusions from such a small series of animals; however, the results suggest that ventilation consisting merely of the passage of much air, does not prevent or cure sinusitis in rabbits. There seems to be no good reason to suppose that it does in man. The term "ventilation," as used in speaking of sinus surgery, should, and doubtless usually does, imply more than the passage of air. When conditions are such that air can flow readily, then there is also room for drainage of secretion.

Microscopic examination of the epithelium in the nasal spaces again showed changes described some years ago.³ The epithelium covering the septum on the side of the open nostril (left) showed more or less extensive loss of cilia and a tendency toward an irregular flattened type of epithelium suggestive of squamous rather than the normal ciliated columnar. On the side of the closed nostril there was found again the mysterious tendency toward the formation of large numbers of goblet cells.

REFERENCES.

1. HILDING, A. C.: Physiology of Drainage of Nasal Mucus. IV. Drainage of Accessory Sinuses in Man. *Ann. Otol., Rhinol. and Laryngol.*, 53:35-41, Mar., 1944.
2. HILDING, A. C.: Experimental Sinus Surgery. IV. Effects of Operative Windows Upon Normal Sinuses. *Ann. Otol., Rhinol. and Laryngol.*, 50:379-392, June, 1941.
3. HILDING, A. C.: Experimental Sinus Surgery. I. Changes in the Morphology of Epithelium Following Variations in Ventilation. *Arch. Otol.*, 16:9-18, July, 1932.

COMMENTS ON THE RESULTS OF TREATMENT WITH
THE NASAL RADIUM APPLICATOR.*

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The irradiation of pharyngeal lymphoid tissue is not new. In 1905, Heinke, at the University of Leipzig, showed that lymphoid tissue was more susceptible to irradiation than the adjacent structures and suggested the use of X-ray and radium in the treatment of lymphoid hyperplasia. The American Medical Association Committee on Problems of the Hard of Hearing stated in their report of 1924 that the most important etiologic factor in deafness was one of those conditions that affect the Eustachian tube; and it is probable that 95 per cent of the cases with middle ear infections spread to this structure by way of the Eustachian tube. To state it emphatically, the cause of middle ear disease is the effect of the obstructed and infected nose upon the Eustachian tube. Ballinger's physiologic law also stresses that interference with the normal tension in the middle ear, whatever the cause, will produce tinnitus and deafness. All of these observations have focused attention to the Eustachian tube and its orifice as the common cause of most deafness. Those ideas were revived with the investigations of Crowe, in 1924, into the cause and prevention of deafness. Radon and radium were used on children for the reduction of lymphoid hyperplasia around the orifices of the Eustachian tubes.

New impetus was given this subject during World War II when aerotitis became the principal cause for grounding pilots both in training and combat. As a result of these findings, the Army Air Force Aerotitis Control Program was formulated in 1944. Ten otologists were called together to discuss the

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problem of aerotitis and outline a program for its control. Recalling Crowe's excellent work with radiation of the lymphoid tissue in the nasopharynx, this technique was advised. Five air forces participated in the program, selecting 6,881 men for treatment and giving over 14,000 individual treatments. The follow-up was fairly accurate and 80 per cent subjective and 96 per cent objective improvement in aerotitis was claimed. The revival of interest in this procedure was carried over into civilian practice in the postwar period and has been used to some extent by pediatricians and otolaryngologists, either correctly or incorrectly.

It may be well to recall the changes produced in lymphoid tissue by radiation. Next to the sex cells, the lymphoid is the most susceptible tissue in the body to radiant energy. Adenoid tissue removed and examined 12 to 24 hours after exposure to radium rays shows that the action is confined to the germinal centers of the lymphoid follicle, where cellular debris, chromatolysis, fragmentation of nuclei and phagocytes containing fragmented cells are seen; after a few days the mitotic figures are absent. Such findings indicate that radiation destroys cells undergoing mitosis and interrupts the normal cycle and replacement of mature lymphocytes, hence the size of the lymphoid follicle gradually decreases in size. Recovery of the tissue begins in approximately one week following radium therapy and is complete in three to four weeks. Proctor states that this interval is important and that the interval between treatments should be 21 to 25 days.

The selection of patients for treatment is highly important and the basis for this choice should be very careful history, otoscopic and nasopharyngoscopic examination (here the use of the nasopharyngoscope is important), cytologic examination of the nasal secretions, and functional hearing tests including accurate audiometric determination; Crowe observed that the loss of high frequencies in children did not always mean inner ear deafness.

Preparation of the patient can be accomplished by spraying the nose with one of the popular local anesthetics, such as

pontocaine, which may later be supplemented by swabbing 4 per cent cocaine solution along the floor of the nose and the inferior turbinate. The nasopharyngoscope can then be passed without discomfort. This procedure is difficult with all children and may require a general anesthetic in most instances; however, it is of paramount importance that the tubal orifice and the nasopharynx be visualized. Particular attention is directed to the small lymphoid nodules between the posterior end of the inferior turbinate and the tubal orifice. This will also later serve as a guide in placing the radium applicator. The remainder of the treatment consists of inserting the applicator into the nasopharynx, where it is secured in place with adhesive strips around the shaft of the instrument. The patient may be seated or lying down; the latter position is preferred in children. The 50 mg. applicator of anhydrous radium sulfate is allowed to remain in position for $12\frac{1}{2}$ minutes on each side of the nasopharynx. Three treatments are required as a rule, but in refractory cases five treatments may be necessary. Burnam states that a unit dosage given at one sitting is more effective than the same total dosage given in daily fractions over a period of a week or two.

The use of radiation in or near the tubal orifice is indicated in cases of deafness in which reduction of lymphoid tissue in Rosenmüller's fossa and the adjacent mucosa is desired. Large adenoid masses may be removed surgically and followed by the use of radium. Much lymphoid tissue can be eradicated by surgery, but small islands that cannot be reached surgically can be controlled by irradiation. Besides deafness, infected lymphoid tissue may play an important rôle in the common cold, recurring otitis media, bronchial asthma, catarrhal otitis media and some cases of chronic bronchitis. Irradiation of this tissue with a 2-gm. minute dose of radium to each side of the nose is effective and has no harmful effect on nasopharyngeal structures.

Observations on the clinical effectiveness of radium therapy in the pharynx, on which this contribution is based, are formed from a small series of 50 cases observed over the last year, and these have been divided into four groups.

1. The first group contains 14 patients. All had hearing impairments which could be classified as conduction deafness. Tonsils and adenoids had been removed, but variable amounts of nasopharyngeal tissue still remained. Changes in the drums were noted, ranging from changes in luster to actual fluid in the middle ear. Normal hearing was recovered in seven of these patients.

2. There were six patients, all adults, whose illness could definitely be classified as aerotitis. Hearing difficulty began after plane flights taken while suffering from nasal blockage due to colds or allergic rhinitis. Radiation did not seem to influence the course of the aerotitis. Three patients were not followed through to completion of treatment; the remaining three are still under observation and to date no improvement has been noted.

3. Another group of 15 cases of allergic rhinitis with bronchial asthma received irradiation because of the presence of pharyngeal lymphoid tissue. All were children 12 years of age or under. Eight showed marked improvement after the second treatment, manifested by improvement in cough and decrease in nasal blockage and discharge. Best results of all the cases were obtained in this group.

4. Fifteen cases were classified as perception deafness with tinnitus, 12 in adults and three in children. Irradiation was carried out because of the presence of pharyngeal lymphoid tissue. No improvement was obtained in any of these patients.

A few conclusions might be drawn from these observations: A great many factors influence the results obtained from irradiation of the tubal orifice. As Crowe states, "It is not the size of the lymphoid tissue but the location of the lymphoid nodules that is important." Involvement of the ear depends on the distribution of this tissue in the nasopharynx. Children obtain better results than adults; this may be due to the fact that children have less connective tissue in the lymphoid structure than adults. Prolonged suppurative processes in the nasopharynx also make the tissue less sensitive to radiation. Best results were obtained in allergic children with

infected adenoid tissue; however, children with deafness obvious to their parents and with depression in speech frequencies and high tones should have the benefit of radiation if hyperplastic lymphoid tissue is present in the pharynx. The mere presence of this tissue is no indication for this treatment if symptoms do not exist. Inorganic iodides taken internally seem to influence favorably reduction in the overgrowth of lymphoid tissue and may be used in conjunction with the applicator. The halide seems to have histolytic effect and aids in the resorption of adenoid tissue. Antibiotics, if indicated, may be used with radiation in selected cases with excellent therapeutic results.

REFERENCES.

1. CROWE, S. J.: The Nasopharynx. *Arch. Otolaryngol.*, 1941.
2. CROWE, S. J., and BAYLOR, J. W.: The Prevention of Deafness. *Jour. A. M. A.*, 112:585, 1939.
3. CROWE, S. J., and BURNAM, C. F.: Recognition, Treatment and Prevention of Hearing Impairment in Children. *Ann. Otol., Rhinol. and Laryngol.*, 50:15, 1941.
4. CROWE, S. J., and BURNAM, C. F.: The Monel Metal Radium Applicator Designed for Maximum Use of Hard Beta Rays in the Treatment of Nasopharyngeal Hyperplastic Lymphoid Tissue. *Miss. Val. Med. Jour.*, 69:109, 1945.
5. CROWE, S. J., and WALZL: Irradiation of Hyperplastic Lymphoid Tissue in the Nasopharynx. *Jour. A. M. A.*, 134:124, 1947.
6. PROCTOR, D. F.: Irradiation for the Elimination of Nasopharyngeal Lymphoid Tissue. *Arch. Otolaryngol.*, 43, 1946.
7. The Use of Radium in the Aerotitis Control Program at the Army Air Forces; a Combined Report by the Officers Participating. *Ann. Otol., Rhinol. and Laryngol.*, 54:649, 1945.

NASAL RHINOSPORIDIOSIS.*

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Although cases of rhinosporidiosis have been reported only sporadically in the medical literature of this country since the early part of the present century, it is probable that this fungus disease is not so rare as the comparatively few published reports indicate. There is no doubt that many recognized instances of infection with *Rhinosporidium Seeberi* have not been recorded and, furthermore, when routine histologic examinations of polypoid growths are neglected, correct etiologic diagnoses often are missed. The histologic picture disclosed in sections of rhinosporidial polyps is so characteristic there is little danger of misinterpretation. The presence of the characteristic sporangia in various stages of development in polypoid tissues should immediately suggest rhinosporidiosis. The sporangia of *Coccidioides immitis* may cause some confusion, but a careful consideration of the morphologic features of the organism in question would eliminate this difficulty. In most instances a preliminary diagnosis may be established by finding the rhinosporidial sporangia in direct examination of material obtained by biopsy or in material scraped from the surface of the polypoid tumors.

Rhinosporidiosis has a worldwide distribution, occurring sporadically in many countries but assuming endemic proportions in India and Ceylon. Fifteen cases have been reported previously from persons living in the United States. Infections in human beings have been found in Texas,^{7,8,11,13,15} Alabama,⁵ Tennessee,¹ North Carolina,^{10,14} Illinois,^{2,4} Michigan,³ New York⁶ and New Jersey.¹² In one instance the patient, a chief

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yeoman in the United States Navy, had been in so many localities it was impossible to determine where the infection had been acquired. The majority of the cases reported have been in young males, with the disease being encountered in a female only once. Nasal involvement occurred in 10 of the persons infected, while in five, eye lesions developed. Although infections have been described from other sites than the

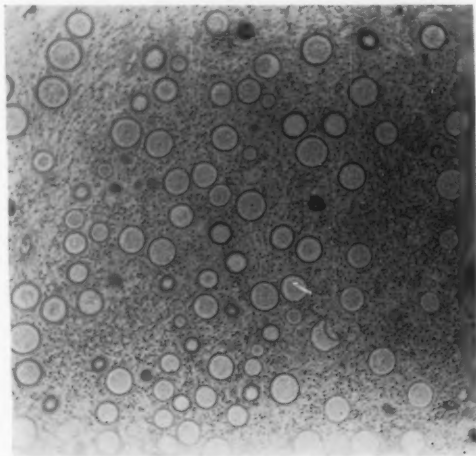


Fig. 1. Section of nasal polyp from Case 2. Immature sporangia of *Rhinosporidium seeberi*, some containing a single nucleus ($\times 50$).

nasal cavity and eye: posterior nares, nasopharynx, pharynx, uvula, larynx, skin, ear, penis, vagina and rectum, such areas of localization have not been observed in this country. Why infections have been limited to the nose and eye in the United States is difficult to explain, since in all probability infection from these sites may be transferred by fingers, for example, to other parts of the body. The mechanism of initial infection and ultimate spread of the parasite have not been elucidated. All experimental attempts to infect animals with *R. seeberi* have failed. These questions may not be solved until the fungus is cultured. If the organism is eventually isolated and

maintained under laboratory conditions, thus permitting experimental studies, many of the existing problems relative to the etiology of the disease will be clarified.

With the belief that infections with *R. Seeberi* do occur more commonly in persons living in the United States than is suspected by the otolaryngologist, as well as by the general

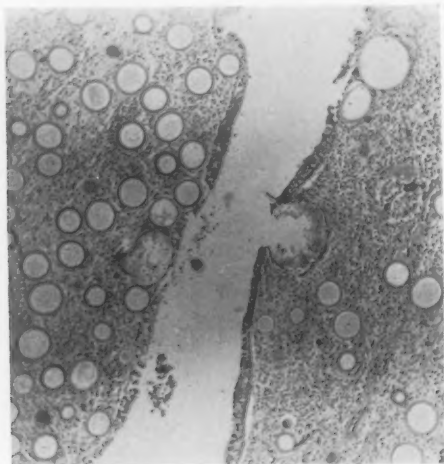


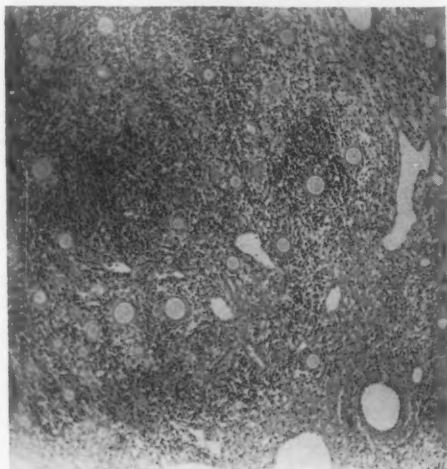
Fig. 2. Section of nasal polyp from Case 2. Very large ruptured sporangium retaining some of the endospores with others discharged into the lumen ($\times 50$).

practitioner, and that the etiology of polypoid tumors may often remain undisclosed, a description of two cases of nasal rhinosporidiosis is presented with the hope of again stimulating interest in and drawing attention to this disease.

REPORT OF CASE 1.

The patient, a girl aged 14, was brought to one of us (R. F. M.) on April 12, 1947. She was born in Rome, Tex., where she lived for one year, then moved to Maud in the same state. Her family came to the San Francisco Bay region in June, 1946, where they are residing at present. At the time the patient was first seen she complained that she had suffered from severe nosebleeds (always from the right side) every two or

three weeks since the spring of 1946. The nosebleeds had started before she left Texas. Two weeks previous to her first office visit she had the sensation of something dropping out of her nose and then subsequently



Figs. 3 and 4. Sections of nasal polyp from Case 1. Early stages in the development of the sporangia ($\times 50$).

noticed a small mass in the right naris. At the time of examination she complained of sneezing and a head cold. A nasal smear was made and a moderate number of cells was found, 9 per cent of which were eosinophiles. On April 12 the polyp was removed by snare, following topical anesthesia with 10 per cent cocaine. The tumor mass, measuring 8 by 10 mm., was attached to the right side of the nasal septum by a short pedicle and was located opposite the anterior tip of the inferior turbinate. The polyp was a strawberry color with white, seed-like areas over the entire exposed surface. The whole pedicle was removed during the operation. A moderate hemorrhage occurred at the point of attachment. Sub-

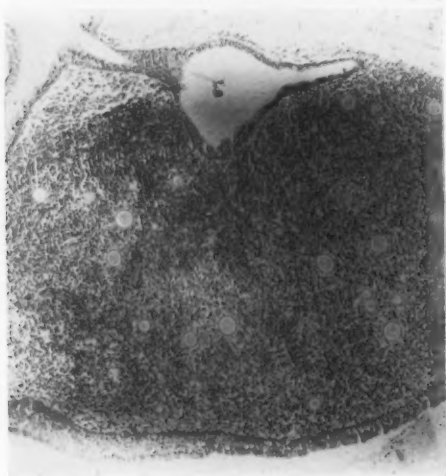


Fig. 5. Section of nasal polyp from Case 1. Sporangia in necrotic area in tissue ($\times 50$).

sequent histologic examination of sections of the polyp disclosed a characteristic rhinosporidial infection. Periodic examinations conducted since the removal of the tumor have not revealed further growth of polypoid tissue.

PATHOLOGIC REPORT OF CASE 1.*

"Sections stained with hematoxylin and eosin and with hematoxylin azur-II eosin show an ovoid polypoid structure with a wide base measuring 11 by 5 mm. It is lined by stratified squamous and, in part, by simple, mucus-producing and

*Kindly submitted by Dr. Jacob Frenkel, Department of Pathology, University of California Medical School.

ciliated columnar epithelium. A few epithelial crypts invaginate the loose and edematous connective tissue stroma which is diffusely infiltrated with plasma cells, lymphocytes, as well as with both eosinophilic and amphophilic polymorphonuclear granulocytes. Throughout the stroma there are spherical structures varying from 15 to 250 microns in diameter, having a densely staining capsule and resembling *Rhinosporidium* in morphology. Those of an average diameter of 50 to 75 microns contain one densely staining body of slightly irregular outline, measuring about four microns in diameter, which is surrounded by loose fibrillar and granular material that usually has shrunk away from the capsule. Several large structures averaging 200 microns in diameter are encountered, which are packed with endospores, as well as with some amorphous and fibrillar debris. The endospores average eight microns in diameter and contain numerous clear vacuoles in their cytoplasm.

"Many of the 'cysts' cause no increase of the generalized inflammatory reaction, but others are surrounded by an increased number of fibroblasts, plasma cells, and some eosinophilic and amphophilic granulocytes. Some of the large rhinosporidial 'cysts' have ruptured, liberating their endospores. These are surrounded by a zone of amphophilic granulocytes, followed peripherally by a zone of proliferating fibroblasts with a rather sharp peripheral border. The surrounding stroma is markedly infiltrated with the inflammatory cells mentioned previously. Some of these granulomatous foci show large necrotic centers with few or no recognizable endospores, but frequently with remnants of the cyst wall. Other granulomata are made up principally of proliferating large fibroblasts that tend to form foreign-body type giant cells; the necrotic centers having been obliterated and no foreign elements are recognizable. Some of the endospores have been discharged into glandular lumina."

REPORT OF CASE 2.

During the fall of 1941 one of us (H. G. J.) received a histologic section of a nasal rhinosporidial polyp removed from a patient in Letterman General Hospital, San Francisco. Through the kindness of Col. Raymond

O. Dart, Director of the Army Institute of Pathology, Washington, D. C., we have been permitted to include this case in the present discussion. The patient (A. I. P. No. 79196), a male 23 years of age, was born in Jackson, Miss., and had never been out of the United States. At one time he lived in Alexandria, Va., for six months. During his service in the United States Army he was stationed in San Francisco, with maneuvers in Fort Lewis, Wash. He reported that he had an obstruction in his right naris for a period of about 13 months. During this time the obstruction had become progressively worse and he complained of the monthly occurrence of a cold and slight nosebleeds. The mass could be seen in the right nostril when a mirror was used. It protruded when he blew his nose, then receded into the cavity. Following removal of the polyp, there were slight episodes of bleeding for a period of two weeks. The pathological report included in the case history supplied by Col. Dart follows:

"Gross: The specimen is a flattened, polypoid, gray mass, 3 x 2 x 0.5 cm. The stalk is very slender and some soft, grayish-white tissue is attached.

"Micro: The sections show a superficial epithelium generally composed of stratified squamous epithelial cells; however, in some regions a typical respiratory epithelium is present. This epithelium often invaginates deep in the loose stroma, and these invaginations connect with occasional glands. There are several focal collections of leucocytes sharply circumscribed in the loose connective tissue. This stromal tissue contains a tremendous number of spheroid bodies having a thick, hyaline, limiting membrane. In some of the bodies a granular substance can be distinguished. A rare large body is filled with small spores. Throughout the loose connective stroma are many lymphocytes, plasma cells and leucocytes.

"Diagnosis: Rhinosporidiosis involving mucous membrane of nose."

DIAGNOSIS OF NASAL RHINOSPORIDIOSIS.

The occurrence of a polypoid or papillomatous mass in the nose, with a strawberry-like appearance varying in color from a pink to a deep red, should be suspected of rhinosporidial origin. The tumor mass when scratched with the fingernails or handled with an instrument usually bleeds readily. Using a proper light source, small white spots will be found distributed over the entire surface of the growth. These are the sporangia. Tumors which have attained an appreciable size are pedunculated in most instances. To confirm these preliminary observations, direct microscopic examination of material collected from the surface of the polyp and mounted in a drop of physiologic saline solution or water under a cover-glass, should be performed. Nasal secretions or washings may also serve as suitable specimens for examination. The mature endospores are round or oval in shape, 6.5 to 10 microns in diameter, with a chitinous wall and crowded with spherical,

refractile bodies measuring up to 2.8 microns in diameter. The unruptured sporangia are thick-walled structures containing masses of endospores when mature. They vary considerably in size, sometimes attaining a diameter of 250 to 300 microns or more.

The critical diagnosis is best made with stained tissue sections. The most striking feature observed microscopically is the presence of the large sporangia filled with immense numbers of endospores. Some of these sporangia may have ruptured, liberating spores into the surrounding tissue or into crevices in the polyp. In addition to the mature sporangia, various developmental stages may be found. Empty cyst-like structures with thick hyaline walls may also be observed. These are sporangia from which all of the endospores have been liberated. Of the fungi which cause diseases in man, *Coccidioides immitis* is the one which is most likely to be confused with *R. Seeberi* from the microscopic, diagnostic standpoint. While it is true that verrucous papillomatous lesions in coccidioidomycosis develop on various parts of the body, the localization of this fungous parasite in the nose, with resulting polypi, in all probability, occurs rarely if at all. The differentiation of these two fungi in tissue sections may be a source of confusion. The sporangia of *R. Seeberi* attain a larger size than those of *C. immitis*. At times, however, size may not serve as a reliable differential criterion, since, for example, the majority of rhinosporidial sporangia found in the sections of Case 1 did not have a diameter of more than 88 microns. With *C. immitis* the sporangia are usually smaller in size, 20 to 60 microns in diameter, although they may in some instances measure 80 to 90 microns. One of the stages in the development of the sporangium of *R. Seeberi*, if present in the section, has such a characteristic morphology that it will greatly aid in the differentiation of the two fungi. It is an immature form, 45 to 90 microns in diameter, containing a single conspicuous nucleus and having amorphous-appearing cytoplasm. Such forms with a single nucleus are not encountered in sections of tissue obtained from persons with coccidioidomycosis. The differences in morphology of the endo-

spores of the two parasites may likewise serve as diagnostic criteria. Those of *C. immitis* are approximately one-third the size (one to three microns) of *R. Seeberi* and do not contain the numerous spherical bodies present in the spores of the latter fungus. Finally *C. immitis* may be isolated from clinical specimens when suitable culture media are employed and laboratory animals may become infected following the inoculation of material containing the organisms. Neither of these laboratory procedures can be utilized in the diagnosis of rhinosporidiosis, since all attempts to obtain the fungus in culture and to infect animals have failed.

SUMMARY.

Fifteen infections with *Rhinosporidium Seeberi* have been reported from persons living in the United States. Ten of these had nasal involvement and five demonstrated lesions in the eye. A discussion of two additional cases of nasal rhinosporidiosis is presented. One is the second in a woman to be reported from this country. Cardinal points to be observed in the clinical and laboratory diagnosis of the disease are noted. To aid in the establishment of a correct etiologic diagnosis, the necessity for preparing histologic sections of all nasal tumors is emphasized.

BIBLIOGRAPHY.

1. WRIGHT, J.: A Nasal Sporozoon (*Rhinosporidium Kinealy*). *N. Y. Med. Jour.*, 86:1149-1153, Dec., 1907.
2. LINCOLN, M. C., and GARDNER, S. M.: A Case of *Rhinosporidium Seeberi* in a Resident of the United States. *Arch. Path.*, 8:38-45, July, 1929.
3. WELLES, C. V., and RIKER, A. D.: *Rhinosporidium Seeberi*; Pathological History and Report of Third Case from the United States. *Am. Jour. Path.*, 6:721-732, Nov., 1930.
4. HANSON, W. L.: *Rhinosporidium*. *Ann. Otorhinol. and Laryngol.*, 40:1013-1020, Dec., 1931.
5. GRAHAM, G. S.: *Rhinosporidium Seeberi* in Nasal Polyp. *Am. Jour. Clin. Path.*, 2:73-85, Mar., 1932.
6. NEES, O. R.: *Rhinosporidium Seeberi* (Clinical Notes). *U. S. Nav. Med. Bull.*, 34:243-245, Apr., 1936.
7. CALDWELL, G. T., and ROBERT, J. D.: Rhinosporidiosis in the United States. *Jour. A. M. A.*, 110:1641-1644, May, 1938.
8. PASTERNAK, J. G., and ALEXANDER, C. S.: *Rhinosporidium Seeberi*. *Arch. Otolaryngol.*, 27:746-765, June, 1938.

9. RUCHMAN, J.: Rhinosporidiosis (Seeber). *Arch. Otolaryngol.*, 30: 239-246, Aug., 1939.
10. ANDERSON, W. B., and BRYNES, T. H.: *Rhinosporidium* of the Conjunctiva. *Am. Jour. Ophth.*, 22:1383-1388, Dec., 1939.
11. GRIFFEY, E. W.: Rhinosporidiosis. *Am. Jour. Ophth.*, 22:1389-1390, Dec., 1939.
12. BARNSHAW, H. D., and READ, W. T.: Rhinosporidiosis of the Conjunctiva. *Arch. Ophth.*, 24:357-361, Aug., 1940.
13. ELLES, H. B.: *Rhinosporidium Seeberi* Infection in the Eye, *Arch. Ophth.*, 25:969-991, June, 1941.
14. ARNOLD, R., and WHILDIN, J. G.: Rhinosporidiosis of Conjunctiva (Case Report). *Am. Jour. Ophth.*, 25:1227-1230, Oct., 1942.
15. SEALE, W. H.; FLINN, C. B., and BRITT, E. C.: Rhinosporidiosis (Case Report). *Arch. Otolaryngol.*, 40:203-205, Sept., 1944.

LIPOID PROTEINOSIS.
(A REPORT OF TWO CASES AND REVIEW OF
LITERATURE.)*

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It is my purpose to bring to the attention of the laryngologists a rare disease, the reports of which, heretofore, have been appearing for the most part in the dermatologic literature chiefly because the majority of study has been done by those interested in diseases of the skin. The early symptom is definitely laryngeal and we, as laryngologists, should be more familiar with the syndrome, as it may be necessary to give relief by tracheotomy and later do a laryngeal plastic procedure to alleviate the chronic obstructive laryngeal symptoms.

DEFINITION.

The term "lipoidosis cutis et mucosae" is given to a definite syndrome characterized by infiltrations of lipoids into the mucous membranes and skin.

Clinically, these infiltrations are most commonly seen in the mucous membranes of the lips, mouth, tongue, pharynx, larynx and vulva. The changes in the skin are most frequently seen on the elbows, fingers, knees, face and along the margins of the eyelids.

HISTORY.

The first description of note published concerning this condition was by Camillo Wiethe,¹ in 1924. He attributed the lesions to a hyaline degeneration of the mucous membrane and skin. Prior to this time, a laryngologist, Siebenmann (1908),

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and later a dermatologist, Lutz (1922), described what seems to be a case similar in type. It was, however, Erick Urbach,² in conjunction with C. Wiethe, in 1929, who coined the present name of lipoidosis cutis et mucosae (lipoid proteinosis) and established it as a clinical entity. The pathology is infiltration rather than degeneration, and as most of the lipid seemed to be bound to a protein and not soluble in fat solvents, the term lipoid proteinosis was given to emphasize this characteristic.

This disease is exceedingly rare. In all, 29 cases have been reported, and in this country only eight. The first case in our literature was described by Tripp,³ in 1936. Others since have been reported by Hansen,⁴ in 1938, Wise and Rien,⁵ 1938 (two cases), Montgomery and Havens,⁶ 1939 (one case), Wile and Snow,⁷ 1941 (one case), Marion B. Sulzberger,⁸ 1942 (one case), J. Ramos de Silva⁹ (one case) and A. D. Campbell,¹⁰ 1944 (one case). In all, approximately 29 cases have been seen since Urbach and Wiethe published their original work. All these cases, while differing in some particulars, demonstrated definite characteristics which make this condition a clinically recognizable entity.

Familial tendencies were first observed by Urbach and Wiethe, who investigated nine cases occurring in four families. Since this publication, additional cases have been reported definitely demonstrating the familial characteristics of this disease. Wise and Rien report two sisters having the disease, and I shall report two brothers who are afflicted.

Urbach also observed a definite diabetic tendency in conjunction with the disease, and several others have confirmed this. He suggests that lipid deposits in the pancreas may explain this phenomena. Others do not show this tendency as reported by Montgomery and Havens, Sulzberger, J. Ramos de Silva, and A. D. Campbell.

Urbach believed consanguinity to be a factor and had several cases where the parents were closely related. J. Ramos de Silva reports a patient whose parents were first cousins. Recently, several cases have been seen without evidence of interrelationship in the parents.

Lipoid proteinosis most frequently begins at an early age. Hoarseness is the earliest and most prominent symptom and is almost always present; however, the case of Sulzberger was not hoarse until grown. At one or two years of age, hoarseness first informs the parents that the child is not normal. In one case reported, a pock-like eruption was described at an early age and no doubt accounts for the fact that in many cases the beginning of the disease is ascribed by the parents as a severe childhood disease.

The disease is gradually progressive with nodular and hyperkeratotic lesions of the skin appearing later (eight to 10 years). The skin of the face has a yellowish, waxy color with a pock-like appearance. Some of the lesions are smooth, depressed and atrophic.

Urbach describes two distinct types of lesions of the skin. One, a nodular and the other hyperkeratotic in character. The former is seen most frequently on the face and scalp, while the latter appears on the extremities. The face and scalp show small pock-like scars and are yellow to waxy or old ivory in color. The face has a somewhat "mask-like" appearance. There are frequently yellowish to brown, soft, depressed, iridescent scars present, localized most frequently about the cheeks, bridge of nose and on the forehead, with no systematic follicular localization. On superficial examination, one might consider the discoloration of the face due to ordinary sun tanning. The hair of the scalp is usually sparse and the beard is thin.

The edge of the eyelids have many small, translucent, bead-like nodules which form a moniliform arch. Almost complete loss of lashes is present in most cases.

The vermillion of the lips shows yellowish to white infiltrations within the mucous membrane; some are raised and nodular, others are small, pin-point papular beneath the surface. The skin at the mouth angles is fissured and slightly keratotic. Similar crack-like lesions are seen in the vestibule of the nose.

The changes in the skin on the other parts of the body dif-

fer as to whether the hyperkeratotic or the nodular form predominates. In all cases, Urbach states, can be found countless very fine, pin-point sized excrescences with mulberry-like processes on the surface of the fingers, giving them a file-like appearance. The proximal interarticular surfaces of the fingers, dorsal and laterally, are particularly involved.

The external surfaces of the elbows and knees usually show large, elevated, ichthyoid keratotic lesions, brownish-violet to yellowish-white in color.

Sulzberger describes a recurrent painful swelling of the left parotid gland in his case, apparently due to valve-like occlusion of Stensen's duct.

Congenital aplasia and hyperplasia of the lateral upper incisors is reported by J. Ramos de Silva; however, his case had a strongly positive Wassermann reaction and he thinks that lues may have been the factor in this congenital defect. Urbach also states that some of his cases had dental developmental difficulties, as has one of mine.

The most important findings from a laryngological point of view are the changes of the mucous membrane of the mouth, pharynx and especially the larynx. The mucous membrane of the lips, especially the lower, has widespread yellowish-white deposits raised somewhat above the surface of the mucous membrane, making them stiff and somewhat thicker than normal. The buccal surface of the cheeks is not usually greatly involved. On the soft palate may be seen yellowish, firm, infiltrated plaques. The tonsils and pharynx are involved with many varied sized, yellowish to white, glistening deposits, with many depressed soft scars.

The tongue has a characteristic stiff, wooden appearance. The dorsal surface is usually smooth and atrophic in appearance. The undersurface is scarred, the frenum is thickened, markedly scarred, and the movement of the tongue is definitely limited.

The larynx has many yellowish to white plaques present, involving the epiglottis, aryepiglottic folds, ventricular bands

and interarytenoid regions. These areas are broad and stiff appearing and have lost their delicate shading of color from one part to another.

The vocal cords are thickened, have lost their normal appearance and frequently the same infiltrative lesions are present as seen in the rest of the laryngeal mucous membrane. The movements of the arytenoids may or may not be hampered. In one case these same changes were seen involving the mucous membrane of the labia minora.

The histologic changes as stated by Wise and Rien reveal an unusually marked poverty of the blood vessels, with dilated and thickened capillaries. There is a dense infiltration of the skin with homogeneous mantles surrounding the sweat and sebaceous glands and the thickened wall vessels. The infiltrate appears in the form of roughly circular homogeneous masses with well defined border. There is no formation of giant cells, foam cells or xanthoma cells, and no evidence of necrosis is present.

J. Ramos de Silva concludes that, "There is an associated or mixed process which seems to consist of a degeneration of the hyaline type involving the thin vascular branches, where the degeneration probably begins, the basal layer of the sweat glands and of the epithelium of the tonsil and also the collagen fibres, without any special structural arrangement. Last, there is an infiltration, secondary perhaps, of a special lipid." The lipid substance becomes insoluble by the action of the chrome derivatives (Ciaccio and Smith-Dietrich methods), thus resisting when acted upon by a strong alcohol and even xylol. This distinguishes it from the neutral fats. The absence of double refraction differentiates it from cholesterol. The use of other methods, particularly the Smith-Dietrich methods, which do not stain the neutral fats, the free cholesterol and the esters of cholesterol, but give a deep blue color to the phosphatides, show the affinities of the lipid substance to the phosphatides and perhaps the lecithin. Blood plasma cholesterol has been within normal limits in most cases. The lecithin is usually slightly increased in both the blood plasma and skin.

The differential diagnosis should be made between lipoid proteinosis and other types of xanthomatosis.

In disseminated xanthomatosis there are lesions of the mucous membranes, pharynx and larynx, but the presence of typical xanthoma or foam cells, touton cells and double refraction lipids will aid in differentiating the two.

Hyaline and amyloid degeneration may be confusing, but stain reactions of the tissue are quite different. Necrobiosis lipoidica dibeticorum and lipoid proteinosis, while both may be seen with diabetes, may be differentiated as cholesterol in the lipoid, is increased and the clinical and histologic pictures are entirely different. Other diseases to be kept in mind are Hand-Schuler-Christian syndrome, also Niemann-Pick disease and Gaucher's disease, pseudoxanthoma elasticum and others.

The prognosis of this disease is extremely difficult due to the lack of follow-up reports. Tripp states that his patient died at the age of 21 of coronary thrombosis, but he was unable to obtain an autopsy.

In most cases therapy has been of little value. Urbach definitely felt that one of his cases benefited by diabetic control; also, Tripp believed his case was benefited by a diabetic regimen. Generally, it is conceded that little can be done except relief for laryngeal symptoms.

CASE REPORTS.

Case 1: S. W., white American boy, age 32. *Family History:* Father of English descent, living and well. No history of diabetes or other metabolic disease. Mother also of English extraction. Living and well and no history of diabetes, allergy, skin diseases or other diseases. No consanguinity of parents. Neither parent had any evidence of skin disease. Had three children, two boys and one girl. The sister has no evidence of this disease but the brother definitely is affected.

The child seemed to be hoarse almost from birth. At eight or nine years of age, the mother observed white patches in the mucous membrane of the lower lip. At puberty, he developed a skin lesion of the face, which was called acne by the parents, who state that this condition caused the pock marks.

The hoarseness gradually became more pronounced during puberty, until at 17 years of age he developed acute laryngeal obstruction. At this time, because of his inability to breathe, a tracheotomy was done by my associate. The examination at this time revealed small, soft, pock-

like atrophic scars of the skin of the face. The hair was plentiful and the eyelids were not involved. There were moderate hyperkeratotic verrucous lesions of the elbows and dorsal surface of the feet, and some fine nodular lesions of the fingers, involving the skin of the volar surfaces, especially of the index and second fingers.

The mucosa revealed many fine, yellowish-white infiltrates on the lower lip, which made it feel stiff and firm. There were yellowish plaques in the buccal mucous membrane, and the pterygomandibular ligaments were white, thick and fibrosed. The soft palate had several discrete yellow-white nodular lesions present. The teeth were irregular, and considerable aplasia was present, especially of the second bicuspsids.

The dorsal portion of the tongue was smooth and had an atrophic appearance. The frenum was white, thickened and fibrosed; and the entire under surface of the tongue had a similar appearance. Due to infiltrations, the tongue had a woody consistency, and there were profound changes in its substances, so that the patient could not protrude it beyond the buccal surface of the lips.

The oropharyngeal mucosa had many glistening, whitish, scarred areas of various sizes, and many yellowish to light brown plaques were also seen.

The epiglottis and aryepiglottic folds were thickened and similarly involved, showing both infiltrative plaques and scarring. The cords were thickened markedly, as were the arytenoids. The cords moved poorly and the glottic chink was very narrowed. At this time considerable edema was present. The Wassermann and chest X-rays were negative. Blood and urine were negative. Biopsy at this time was reported as "granulation tissue."

He was unable to breathe without the tracheal cannula until 1937, but otherwise was in good health. He was decannulated in 1937, and except for moderate laryngeal obstruction, seemed to get along satisfactorily without the tube until late in 1943. During this time, several biopsies were taken with inconclusive pathologic reports.

In 1939, he was again seen by me, complaining of an extremely sore tongue. Examination revealed a very large ulceration on the posterior portion of the tongue, which was over 1 cm. in diameter, was deep and filled with necrotic tissue, with very little inflammatory reaction present. Smears were made. Fusiform bacilli and spirillae were present; however, this involvement did not have the appearance of a Vincent's ulceration. During the next two months several of the necrotic ulcerated lesions of the tongue appeared at different locations and gradually healed. Since this episode the patient insists that large doses of vitamin A seem to control the soreness of the tongue.

Wassermann and Kahn reactions were normal at this time. Later, this same year another piece of involved tissue was obtained from the pharynx. Dr. Richard Bailey, a dermatologist, was consulted and through him was obtained a pathological report from H. Montgomery, of the Mayo Clinic, who recognized the condition as lipoid proteinosis. The study revealed homogeneous thickening of the vessels' walls, with widely disseminated deposits of a lipoid material in close relationship with phosphatide throughout the entire structure. Methyl violet stain for amyloid gave a very faint purplish color. Injection with Congo red was negative; stains with Congo red were negative for amyloid. No foam cells or double refraction were seen. Throughout the entire period his blood sugar has remained normal and the blood cholesterol has likewise remained normal.

The patient seemed to develop normally, except that he was extremely

short of breath, due to the lack of ample laryngeal air space, and following the tongue episode the progress of the disease seemed to be stationary. Because of being called to the naval service in 1941, I lost contact with the case until 1946. During this period his laryngeal obstruction apparently became more marked, and he was sent to the Mayo Clinic, where a laryngeal plastic procedure was done to procure more breathing space. Since then he has been working regularly and has had no difficulty and there has been no evidence of progress of the disease. The patient is now healthy and happy and doing his work normally. He is married and has a normal child. He, however, states that the keratotic lesions of the elbow and the changes in the hands become "soft" at times for no apparent reason.

Case 2: K. W., age 34, brother of S. W., was seen with the following report:

His mother states that he has always been hoarse, but not nearly so much as his brother, S. W. His early life seems to have been without sickness; however, his mother states that he was always "delicate."

On examination he had very similar skin lesions as seen in the brother. There was the fine, soft, yellowish-white, pock-like scars about the face. Hair was normal, the eyelids were not involved. There were large, raised verrucoid hyperkeratotic lesions of the elbows, knees, dorsa and feet.

The mucous membrane of the lips revealed a yellowish-white granular infiltration present. The buccal surface of the mouth and soft palate had a similar appearance. The under surface of the tongue was pale white and the frenum was definitely fibrotic, which limited the movements of the tongue, but not so much as in the case of his brother. On the posterior surface of the oropharynx was a large, white fibrous area, 2 cm. in diameter, which extended up into the epipharynx. Also, several yellow to white plaques were present.

The epiglottis was thickened and many small, white, glistening areas were seen in the interarytenoid region and on the ventricular bands, especially the left. The vocal cords were moderately thickened and had lost their typical white appearance, but movements were good.

This patient has always been hoarse but has had no other complaints. He is well, works as a salesman, and has three children, the oldest eight years, all perfectly normal.

He is convinced that he is well, and consequently I have been unable to obtain a specimen of his lesions for study.

CONCLUSION.

Lipoid proteinosis or phosphatide lipoidosis is a rare disease of the mucous membrane and skin due to disturbances in the fat metabolism.

Two cases are described in brothers, ages 32 and 34, who have been observed by the author since 1932.

Clinically, these findings form a definite recognizable syndrome with prominent laryngeal symptoms.

Diagnosis can be made clinically and by histological and chemical means.

BIBLIOGRAPHY.

1. WIETHE, C.: Kongenitale diffuse Hyalinablagerungen in den oberen Luftwegen, familiar auftretend. *Ztschr. f. Hals-, Nasen- u. Ohrenheilk.*, 10:359, 1924.
2. URBACH, E.: Ueber eine familiäre lokale Lipoidose der Haut Schleimhaute. *Arch. f. Dermat. u. Syph.*, 159:451, 1929.
3. TRIPP, R. N.: Lipoidosis Cutis et Mucosae. *N. Y. State Jour. Med.*, 36:619, 1936.
4. HANSEN, P.: Ein Fall von Lipoidproteinose. *Arch. f. Dermat. u. Syph.*, 175:618, 1937.
5. WISE, F.: Lipoidosis Cutis et Mucosae. *Arch. Dermat. and Syph.*, 35:357, Feb., 1937.
6. MONTGOMERY, H., and HAVENS, F. Z.: Xanthomatosis: IV. Lipoid Proteinosis (Phosphatide Lipoidosis). *Arch. Otolaryngol.*, 29:650, Apr., 1939.
7. WILE, U. J., and SNOW, D. S.: Lipoid Proteinosis: Report of Case. *Arch. Dermat. and Syph.*, 43:134, Jan., 1941.
8. SULZBERGER, MARION B.: A Case of Lipoidosis Cutis et Mucosae (Urbach and Wiethé). *THE LARYNGOSCOPE*, 52:286, Apr., 1942.
9. RAMOS DE SILVA, J.: Um caso de amiloidose primitiva da pele. *An. brasil. de dermat. et sif.*, 15:201, 1940.
10. CAMPBELL, A. D.: Lipoid Proteinosis. *U. S. Nav. Med. Bull.*, 42:669 Mar., 1944.

Paulson Medical and Dental Building.

CENTRAL ILLINOIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

The next meeting of this Society will be held at the Abraham Lincoln Hotel in Springfield, Ill., Nov. 12, 13 and 14. The officers of the Central Illinois Society of Ophthalmology and Otolaryngology are: President, Dr. Clarence E. McClelland, Decatur, Ill.; President-elect, Dr. Clifton T. Turner, Peoria, Ill.; Vice-President, Dr. Harold Watkins, Bloomington, Ill.; Secretary-Treasurer, Dr. Philip R. McGrath, Peoria, Ill.

MASKING AS AN AID IN AUDIOMETRY IN CHILDREN.*

MAURICE SALTZMAN, M.D., and MATTHEW S. ERSNER, M.D.,
Philadelphia, Pa.

Generally, audiometry in children under the age of five years is unreliable. The audiometric threshold curve in a child of six to ten years is frequently higher than that of his true hearing acuity. He lacks the capacity for concentration and acknowledges hearing a sound only when it "pounds" on his ear. In some cases, the children, not having learned to pay attention to pure tones, when applied to each ear separately, give bizarre audiograms. Under these circumstances, the speech-hearing capacity carries more weight. In a specific case the audiologist may admit frankly that he is unable to obtain an accurate audiogram due to the immaturity of the child. The case to be presented, however, demanded an immediate solution. On the strength of an audiometric study at the public school, a girl of nine years was told that she had a hearing defect. The pupil, being of a psychoneurotic makeup, began playing the rôle of a "deaf girl." There was no speech defect and her speech hearing was practically normal, while repeated audiograms showed a severe form of perceptive deafness. Through the aid of masking we were able to obtain a normal audiogram and to straighten the child mentally by convincing her that her hearing was normal. As far as we know, the effect of masking in facilitating audiometry in children was observed for the first time.

CASE REPORT.

H. W., white, female, aged nine years, was referred to the Hearing Clinic of the Temple University Medical School following discovery of a

*From the Department of Otorhinology, Temple University School of Medicine.

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severe hearing defect during routine audiometric examination at school. At the clinic, on May 25, 1948, and June 1, 1948, two audiometrists performed repeated audiometric tests on this patient. Consistently, the several audiograms presented the same pattern and they all showed a marked degree of perceptive deafness.

The mother had not noticed anything abnormal prior to the school report, but since that time the child has been going about with the claim,

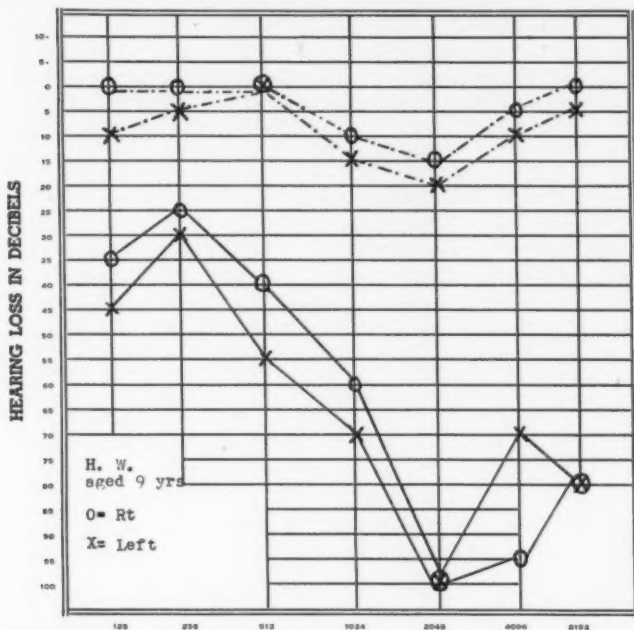


Fig. 1. The curves of solid lines represent the audiometric patterns for both ears obtained by different testers at variable intervals (without masking). Each broken line with dots represents the audiometric pattern obtained in one ear while the other was masked on June 1, 1948.

"I'm a deaf girl." There is a history of an ear infection in infancy and measles at the age of three years. The family history is negative for deafness.

In the physical examination of the patient no evidence was found to suggest a neurologic abnormality or hypothyroidism. Both eardrums gave a normal appearance but the left one was slightly retracted. The tonsils were small, but embedded, and the child appeared to be a mouth breather. No speech defect was present, and speech hearing was within the normal

range. All our studies of the child convinced us that no organic basis for the pure tone deafness was present. Her answers, however, appeared to be truthful and her reactions during the tests were natural for a child of her age. Thinking that poor attention may be a contributing factor, we pleaded with the patient to concentrate when fainter sounds were

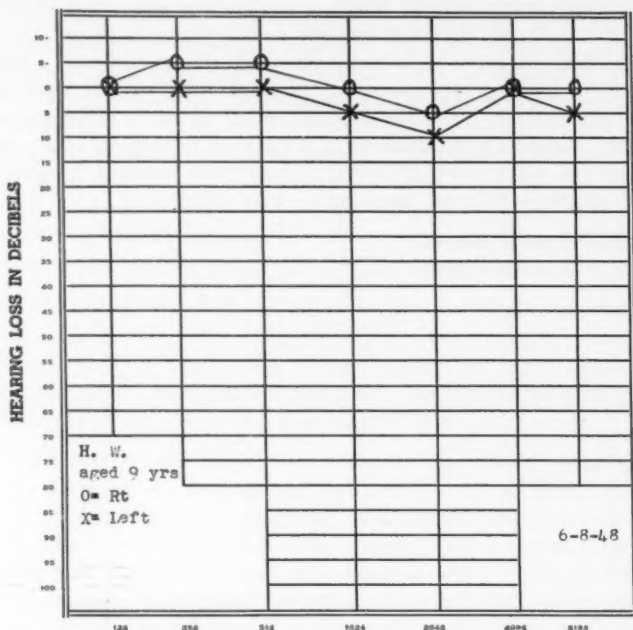


Fig. 2. A practically normal audiogram (without masking) was obtained one week after indoctrination in listening to pure tones.

presented, but the results were no better. We then proceeded to explore the effects of masking, and we were pleasantly surprised when a comparatively good audiogram was obtained in each ear upon the masking of the other ear.

Comment: As repeated audiograms presented an identical pattern, simulation may be ruled out particularly as it concerns a child. It is conceivable that even at the age of nine years a child may not have learned yet to discriminate a pure tone unless it is sufficiently loud to compel attention; however,

by applying a thermal noise to one ear, a sense of total absence of sound in the other ear is created, the "empty" ear becoming alerted to sounds close to its threshold of hearing. In logic and rhetoric, the concept of the contrast effect is utilized extensively. Ideas are emphasized by contrast. The brain is impressed more readily when a contrasting sensation is presented to it. By masking one ear and applying a pure tone to the other, we were able to produce a striking contrast effect. A child, being impressionistic, is most suitable for learning by this method. That the acquisition of memory patterns for sound is easily accomplished in a child is proven by our case. One week after indoctrination in pure tone hearing, a normal audiogram — without masking — was obtained.

1923 Spruce Street.

1915 Spruce Street.

EDITOR'S NOTE.

For the past few years we have been publishing in *THE LARYNGOSCOPE* historical sketches on such famous men as Thomas Wharton, Gabriel Fallopio, Guy Babington, Antonio Valsalva, Nathaniel Highmore, Prospiere Ménière, etc., by Dr. Walter A. Wells, of Washington, D. C., which we felt were of great interest to our readers. Until recently his accuracy in these articles has never been questioned and we are, therefore, somewhat surprised at the rather vigorous objections of Dr. J. M. Castillo to Dr. Wells' statement that Dr. Guy Babington was the originator of the laryngoscope.

We asked Dr. Wells to reply to Dr. Castillo's criticism of his article. We felt that such a reply was necessary not only to afford Dr. Wells an opportunity to answer his criticism but also to give *THE LARYNGOSCOPE* an opportunity to prove that it is not in the habit of publishing fiction.

We might here remind Dr. Castillo that when he criticizes the accuracy of another author it might be well if he, himself, were absolutely accurate. We refer to his remark that "... By a stroke of fate the homage was in London and it was the English, Babington's compatriots, the initiators of the homage who would be accomplices in what, according to him, would constitute an intellectual fraud. Even the King of England would be an accomplice, as he received Garcia personally and presented him with the Victoria Cross..."

It should be pointed out that this honor, the Victoria Cross, is awarded only to British soldiers or sailors for deeds of valor on foreign fields; never can it be awarded to a foreigner nor for cause other than deeds of valor on foreign battlefields.

It follows that Garcia could not have received the Victoria Cross. Did Dr. Castillo perhaps means the Victorian Order?—a very different decoration.

Dr. Wells' original article on Dr. Guy Babington appeared in the August, 1946, issue of *THE LARYNGOSCOPE*. We feel that our readers will be interested to read Dr. Castillo's comments and also Dr. Wells' rebuttal to Dr. Castillo's criticisms.

It seems to us that Dr. Wells has proven himself completely right in his contention, and we hope that his article will result in credit for the invention being given to Dr. Babington.

**INTERNATIONAL CONGRESS OF OTOLARYNGOLOGY,
LONDON, 1949.**

The British Association of Otolaryngologists is organizing the Fourth International Congress of Otolaryngology, to be held in London from July 17 to July 23, 1949. There will be further meetings, for those who wish to go, at Oxford, Cambridge and Edinburgh on July 25 and 26. It is hoped that a full academic program will be arranged, and also various social functions.

The secretaries of the National Otolaryngological Societies have been circularized and asked to send a list of their members for individual notification. Should any association not receive this letter, they should communicate with the General Secretary, F. C. W. Capps, F.R.C.S., 45, Lincoln's Inn Fields, London, W.C. 2.

**MANUEL GARCIA, INVENTOR OF THE
LARYNGOSCOPIC METHOD.**

REPLY TO DR. WALTER A. WELLS.*

**J. M. CASTILLO, M.D.,
La Plata, Argentine.**

Almost 100 years have passed since Manuel Garcia was recognized as the inventor of a method which permitted visualization of the larynx. It comes as a shock that someone should say it was not he.

Dr. Walter A. Wells, of Washington, D. C., publishes in the August, 1946, issue of *THE LARYNGOSCOPE* an article entitled, "Benjamin Guy Babington, Inventor of the Laryngoscope." Anyone reading the title will have a first impression of strangeness, as the title itself makes us doubt whether something we have been taught as an article of faith is or is not true. As well disbelieve what has been said of Lister, Pasteur, Koch, to mention some great men, if it were enough, as Descartes says, "to find in everything a reason for doubting it." This, which is not so difficult, is dangerous, as universal doubt would lead inevitably to our own annulment; however, neither should we believe everything in order not to go to the opposite extreme, and, therefore, we must find the reasoned truth.

Wells tries to destroy with his article the belief held for 100 years on the discovery of laryngoscopy. He tries to rob Garcia of the post of honor assigned to him by the history of medicine and to give it to Babington. He uses his arguments to convince. I, personally, find them insufficient.

Every invention has its precursors, and by certain conventionalisms, the world of science recognizes the rights of certain men to be recognized as the inventor or author of certain

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things. For instance, no one tries to take away Pasteur's fame because Davaine, before him, thought micro-organisms caused fowl cholera, etc.

Our cause is no exception to this rule, and we did not need Dr. Wells to tell us that there were other worthy men who, previous to Garcia, had attempted to visualize the larynx. We admit this fact; the laryngologists of that time knew it, and Dr. Tapia knew it in 1905. We knew that Babington was one of the precursors, because Dr. Tapia, in his 1905 book, mentions it and gives the sketch of Babington's mirrors, exactly the same as that given in *THE LARYNGOSCOPE* of 1946. What we did not know was that one could so lightly try to change what mankind has believed for 100 years, and that so ambitious and inconsistent an article would appear in a journal of such prestige as *THE LARYNGOSCOPE*. The least a man of science could do in a similar attempt is to carry out a study which consults and exhausts the existing literature, and after having made such a conscientious review, present the idea to the scientific world and wait for the opinion of those who also have something to say.

We cannot conceive that any laryngological journal should accept an article of such importance, and present it without discussion and approval. If it were so simple to decide upon important matters, as Wells does, we might expect that all the knowledge that mankind possesses would be subject to revision by anyone so inclined, without any check other than his own conviction, if he had any; thus, what so far have been considered eternal values and the pride of man would be overthrown.

The chronological order and documentation established by Wells in the history of laryngoscopy is as follows:

These are the data offered by Wells on the basis of which he calls Babington the inventor of the laryngoscope. Presented thus, one is tempted to believe him, but do not be hasty. They are exact data, except for that of Senn, which he could and should have verified, and they have, on the other hand, the double fault of being partial and incomplete. Besides,

these data are not new, and Wells did not discover them, since they were already well known in 1905, when over 50 laryngoscopic societies representing all the civilized countries paid their homage to Manuel Garcia in London. What Wells offers is purely a personal interpretation; and although everyone may think as he pleases, one does not always think the truth when he thinks as he pleases.

Among those present at the tribute to Garcia were those considered the fathers of laryngology, and it is improbable that they were all mistaken. Undoubtedly, the interpretation of these great laryngologists should be worth more than what Wells thinks today.

Is it possible that all these great laryngologists were mistaken, as Wells says? It might have occurred, but we would accept it only if Wells had discovered some new document unknown to them; but this was not true, and Wells has discovered nothing. These men already knew Babington and what he had done, still they recognized Garcia as inventor of the method. This being true, on what does Well base his contention, on his own interpretation? He can have it; I will continue to believe the great masters.

Based on the objectivity of facts, we ask what happened afterwards to Babington's glottiscope? Nothing. What progress did laryngology obtain with it? None. Who used it and applied it clinically? No one, except its author who abandoned it. Not even Babington himself has left a single reference that tells us he succeeded in seeing the vocal cords, as he speaks of only the epiglottis and upper portion of the larynx in vague terms. Between 1829 and 1855 there was no progress in laryngology by the utilization of Babington's instrument, not because the author did not know how to document his findings, as is proved by his numerous works, but because, like Senn, he never succeeded in seeing the vocal cords and, therefore, abandoned the method. Tapia includes him in the list of unsuccessful attempts. It is of no avail that, in 1864, when Garcia's discovery was already in progress, Mackenzie tries to show us Babington working for several years with

his glottiscope. This was not really true, for Babington, from 1830 on, dedicated himself to other activities. He was much more interested in the study of organic chemistry, and it was in 1830, as result of his studies on kidney diseases, with Bright, that he published his work entitled, "Some Considerations with Respect to the Blood, Founded on One or Two Very Simple Experiments on That Fluid" (*Med. Chir. Trans.*, 1830, XVI). Babington also devoted himself to the study of chorea, establishing the beneficial effect of arsenic in that disease, calling attention, for the first time, according to Wells, to the erythema which is occasionally seen in that disease. Other books on epidemiology, among them the monumental *Pathologie of Sergeant*, do not mention either this sign or Babington.

Afterwards an episode occurred which shows that Babington was not so modest nor so generous as Wells pictures him, and which shows that at that time, as well as in our own, there were medical rivalries within the hospitals, and that the better man did not always win. This was the battle between Babington and Hodgkins to obtain a vacant post in Guy's Hospital. At that time Hodgkins was already highly esteemed in European scientific centers, and it was hoped he would be the one designated; but it did not turn out this way, and Babington was the one favored. Hodgkins was so affected that he gave up medicine and retired to Palestine, where he died. History did him justice and has placed Hodgkins on a much higher pedestal than Babington.

Babington was not a consistent spirit with a definite vocation. He dabbled in philology and literature and, perhaps because he wanted to try everything, he was always of lesser stature than the three great men who were his colleagues at Guy's: Addison, Bright and Hodgkins, three luminaries of medicine.

After 1850, he devoted himself to epidemiology, being the first president of that society, to which he was re-elected until 1864. He has been called versatile, also, because he wanted to be a painter, a sculptor and a poet. He thought himself gifted

for all; but the truth is, we do not owe to him any masterpiece, and where, we repeat, is his work in laryngology? If it existed, as Mackenzie says, Babington would have documented it, as he documented all he did. The truth is that he produced a model of a laryngoscope based on the same principle as that of Senn, and, obtaining no practical results, abandoned it. That is all there is as far as laryngoscopy is concerned.

When one intends to modify a concept which mankind has believed for 100 years, and one wishes to erase the memory of a great man, one must be documented to the maximum, without missing one antecedent or one reference. This is what Dr. Walter A. Wells has not done. To prove it, I am going to transcribe the much more complete chapter, which was intended only to inform, of Dr. A. G. Tapia's book on Manuel Garcia, published in Madrid in 1905, page 65. (This can be compared with what Wells says in *THE LARYNGOSCOPE* in 1946, which I have also transcribed.)

What can be deduced from the comparison of what Tapia said in 1905 and Wells in 1946?

1. That the chapter of Tapia's book is much more complete than Wells' article. This is unpardonable for Wells, working in Washington, D. C., where there is the most documented and best classified library in the world. Wells forgets that in Egypt and in Pompeii laryngoscopes similar to ours have been found; he forgets to cite Cagniard de Latour, Selligie, Bennatti, Baumes, Liston, Warden and Avery.
2. That he does not mention that Cagniard de Latour had already used the small mirror in 1825, and tries to belittle Senn's presentation by making it coincide with that of Babington, when the truth is that Senn presented his mirror in 1827, two years before Babington.
3. That he minimizes everything that does not favor his principal objective, as shown by his failure to recognize the importance of Bozzini's apparatus which "touches the bases of the actual procedure" (apparatus for reflecting the image of the larynx and artificial illumination).

4. That, finally, we do not know why Babington must be the favorite and called the author of laryngoscopy, when, before him, unknown authors of Egypt and Pompeii, and Levret, and Cagniard de Latour, and Senn, had already discovered and used it.

5. That if after Babington there continued to be further attempts to solve the problem, it was because it had not yet been solved; the presentation of Garcia was, on the contrary, definitive, and it was from him that the science of laryngoscopy began, developed and reached its maturity.

I wish now to use the same arguments and even the same words that Wells uses in his work to favor Babington against Garcia; but with the difference that I will use them against Babington. Thus I will prove the inconsistency of his contention.

1. Wells says: "The importance of an invention should be judged really not by comparison with what has occurred after it, but by comparison with what there was before."

Exactly, and we ask: What was laryngoscopy before Garcia and after Babington? Absolutely nothing, because the practice of laryngoscopy was not benefited and did not progress through Babington's glottiscope. Not even the laryngologists of London used it as a method of investigation, wherefor we may say that if it was nothing before Babington, it continued to be nothing after him. It is for this reason that it has not occurred to anyone, except Wells, to take from Babington his character of one more precursor.

2. Wells says: "It should be recalled that before the days of laryngoscopy, the larynx was considered, from every point of view, an internal organ."

I ask: To what days does Wells refer? I suppose that it would not be those of Babington in 1829, since after those days the larynx continued to be considered an internal organ. We recall that Trousseau, in 1832, denied that the vocal cords

could be seen, and that Liston, in 1840, continued to use digital tactus to determine the existence of tumors of the larynx. If Liston sometimes used a mirror, it was to see large tumors, and not the vocal cords, which is very different, and besides he used a dental mirror and not that of Babington. We conclude, therefore, that it was not Babington who took from the larynx its character of an internal organ, and, therefore, we cannot attribute to him what he did not do.

3. Wells says: "The introduction of the laryngoscope really marks the beginning of the science of laryngoscopy."

We reply that it is because we know this that we do not consider Babington as the introducer of the method, as it was not by him that this science was begun, but by the triad, Garcia, Türck and Czermak.

4. Wells says: "No one can really be called the inventor of a thing which has been invented previously." Things being so, we do not see why he calls Babington the inventor of a thing which was already discovered by the Egyptians, the Pompeians, by Cagniard de Latour and by Senn.

I have no right to weary the attention of my readers by prolonging this literary game. We have only to be realistic and reasonable to understand that one can play with words a great deal. It is facts which count, and the concrete fact here, clear as daylight, is that it was after Garcia's presentation and through his work that laryngoscopy was begun. It is not worth while to continue arguing with someone who does not bring documentary proof that this was not true. We have made this commentary because it was necessary to give some reply to Dr. Wells, but not because Garcia really needed it. We will go on believing that it was he who invented the laryngoscopic method, because, if it were not so, Babington's contemporaries would have denied it, and even Babington himself, who was a member of the Royal Society where Garcia appeared in 1855. Because, to the greater glory and honor of Garcia, as if he wanted to take the bull by the horns, he had the courage to go to London with his mirror and his documented observations, and there present himself in the Royal

Society, of which Babington was a member. Whether the latter was present or not, we do not know; but it is enough to know that he was living in London, that he must necessarily have known about it, and that, despite this, neither Babington nor any of his contemporaries ever denied it.

On this important point of Babington's presence in London and his silence when Garcia appeared, Wells says:

"It was in 1855, as you recall, that Garcia presented his memorandum to the Royal Society announcing the invention. In this same year, Babington published a small volume entitled, 'Passing Thoughts in Sonnet Stanzas.' Together with his original poems there were others translated from German, French, Italian and Spanish.

"Whether Babington knew of Garcia's presentation or not, we do not know. It could have been so, as he was a member of the Royal Society — in fact, he was a member of the Council for some time — and we find that in 1859 he contributed a memorandum on some drug themes. That he did not protest and defend the priority of his own invention was, nevertheless, in harmony with his character. He was always so modest and simple that he cared more for the progress of science than for his own celebrity."

There is no doubt that to the imagination and gratuitous hypotheses of many historians we owe great errors. If to this we add the dialectic play that permits us to present as certain even the most absurd sophisms, then the demonstration of an error can be so plausible that it seems certain until we oppose it with the severe reasoning of logic.

Wells recognizes that Babington was in London in 1855, when Garcia appeared, and says that he was a member of the Royal Society and even on its Council; but that he does not know whether Babington was aware of it or not. The natural, logical and correct thing is to think that he was aware of it, as it was published in the seventh volume of *Proceedings of the Royal Society of London*, March 22, 1855, and Babington, being such a lover of the progress of science, as Wells says,

could not have failed to read the titles, at least, of what was presented at the Society of which he was a member and councillor. We must accept the fact that he was aware for Babington's own sake, as otherwise we place him in the dilemma of having to think of him as stupid or absent-minded; and as he was nothing of the sort, we accept that he was aware. Why did he not protest? Ah! That we do not know. Wells does not know either; but he supposes and deduces, on his own, that it was because Babington was very modest. This is an inconsistent and puerile deduction. Babington was not so modest as Wells would have him, because at this point it suits him that he should be so. We have already seen this in his fight with Hodgkins; and we also think that nobody is modest who, confident of his talent, tries to undertake and excel in all the activities and manifestations of the human mind.

It is more correct to think that Babington did not protest against Garcia because he was really an intelligent and honest man. That he understood the value of Garcia's observations and approved them with his silence. That he was not resentful, but perhaps complacent, since he never devoted himself to laryngology, as all he had done was to present that little instrument of which perhaps he kept only a smiling recollection. It is more logical and more in keeping with Babington's character to think this, than to think as puerilely as Wells does in saying that Babington knew and did not defend his priority through modesty. This conduct, as far as I know, is only adopted by fools, and Babington, certainly, was not a fool.

This was the central, not the only, part of the homage which the official, scientific and musical world offered to Manuel Garcia in London. Kings, emperors, geniuses of medicine and of art recognized in Garcia the hero that Wells now wishes to overthrow. Semon said that Manuel Garcia had erected for himself, with his invention, a monument more durable than bronze, and higher than the pyramids of the kings, but according to Wells, he was mistaken. According to him, they were all mistaken. Perhaps Walter A. Wells is a genius superior

to all mortals, the sole possessor of the truth. By a stroke of fate, the homage was in London, and it was the English, Babington's compatriots, the initiators of the homage, who would be accomplices in what, according to him, would constitute an "intellectual fraud." Even the King of England would be an accomplice, as he received Garcia personally and presented him with the Victoria Cross. Good-bye to the traditional severity, equanimity and documentation of the English Royal House! And the curious thing is that Wells sustains his thesis, not because he has discovered things that they did not know, but because it occurs to him that it must be true; as if he alone possesses the truth, has to teach it to the whole world, and, therefore, tries to destroy the work of Garcia and the reason for that homage. Wells wants to be an iconoclast, but he will not succeed, as for that it is necessary to be documented more seriously.

Yes, Dr. Wells, more seriously. I believe that one must have more respect for the opinion and prestige of those great men. Although it is true that they also could be mistaken, it is not so easy that they should all fall into an error dealing with a fact of this kind. If you do not agree with this fact, and have no arguments of value to oppose to it, advance the hypothesis and request a review of the question by the hundreds of laryngological societies in the world so that they also may give their opinion; but do not declare the truth yourself; do not pontificate; do not try to impose "your" truth; because, with this conduct, you expose yourself to disbelief.

I, personally, do not believe it, Dr. Wells; but neither do I pretend that the rest believe what I think. What I do contend is that the question be discussed by this Society and the other laryngological societies of the world, including those 16 which called Manuel Garcia their father before 1901.

It is important to all laryngologists who love the truth that the fatherhood of the invention which gave life to our specialty be established definitively; that the problem return to its starting point and be posed anew; not to Wells' starting point, but to the generous point of departure that Garcia him-

self established in making a toast at the banquet in his honor, as follows:

"You will not expect me to make a speech, of course. If I dare to take the floor, it is to express to you a thought which obsesses me and which the brilliance of the presentation which has just taken place has brought into my mind.

"The rôle of the personages which have figured in this ceremony should have been reversed. The congratulations belong to you.

"To you and to your societies, they should be addressed. It is obvious that the success which the little instrument has obtained is owed absolutely and solely to you and the societies you represent. Deprived of the powerful support of your science, it would have fallen into complete oblivion (*et ego quoque*).

"Therefore, I consider myself as an unworthy usurper, accepting what in reality belongs to you, and, by a scruple of conscience, I confess it."

You see, fellow laryngologists, and you, too, Dr. Wells, that Manuel Garcia did not try to appropriate anything; he was a correct and strict man, and he wished that the homage was reversed and offered to the laryngologists instead of to himself; but those men of science believed it was to Garcia that homage was due, and gave it without reservation. To think that they were all mistaken on this subject, which they knew as well, or better, than we, is an audacity, and even . . . the word is harsh, but I am going to say it: an insult.

COMMENTARY.

A special meeting of the Sociedad Argentina de Otorrinolaringología was held on Aug. 27, 1947, at the request of Dr. Castillo, who wished to reply to Dr. Wells' article supporting Babington as inventor of laryngoscopy.

Dr. Castillo began by saying that although it is never pleasant to make a reply to a scientific article, he felt in this case honored to defend a noble cause, the right of Manuel Garcia to continue being exalted by laryngologists.

He was happy to have present a Spanish laryngologist, Dr. Núñez,

and regretted that Dr. Wells was not present. He said he had specially invited the Cultural Attaché of the U. S. Embassy, who did not attend; but he promised that whatever was said, Dr. Wells would know of it exactly, and that he invited Dr. Wells to hold a public debate, if he so desired.

He delivered orally most of the work published fragmentarily in this issue, reading those passages which he considered necessary to give more exactness in dates, name and arguments.

DISCUSSION.

Dr. Viale del Carril congratulated Dr. Castillo on his work and believed it would not be possible to speak against Garcia; first, because of Tapia's monograph, and next because of this communication which has exhausted the arguments against Wells' thesis.

Prof. Errecart sets in relief the personality of Manuel Garcia and says he always taught that it was Garcia who invented the laryngoscope and that through him laryngoscopy developed. He is entirely in accord with the concepts voiced by Dr. Castillo.

Prof. Núñez congratulated Dr. Castillo on his talk, which he called magnificent, and said that he found only one fault, which is that of having given too much importance to Wells' work, since the merit of Manuel Garcia is definitively established. He recalled with affection Prof. Tapia, who has every year dedicated a class to the discovery of the laryngoscope by Manuel Garcia.

Dr. Castillo replied to Prof. Núñez that if he gave importance to Wells' work it was only because it had been published in such a well known and widely circulated journal as THE LARYNGOSCOPE, and because he fears that, if no one replies to Wells' thesis, people may come to believe what he says, and this will be the starting point for gradually forgetting Garcia in the citations of books and journals.

THE CASE OF BABINGTON VERSUS GARCIA IN RE
THE INVENTION OF LARYNGOSCOPY.
REPLY TO DR. JOSE MARIA CASTILLO.

WALTER A. WELLS, M.D.,
Washington, D. C.

In a paper published in *THE LARYNGOSCOPE* (St. Louis), August, 1946, I dared to express the opinion that the so-called indirect method of laryngoscopy was not invented, as widely believed, by Manuel Garcia, a singing teacher of Paris and London, but by a young London practitioner of medicine named Benjamin Guy Babington.

I advanced what I regarded as adequate and convincing data in support of this claim, but a few months ago I received through our State Department at Washington a communication from Dr. Jose Maria Castillo, a distinguished Argentine laryngologist, to the effect that he was challenging my contention at a specially called meeting of the Argentine Society of Otolaryngology, to which I was invited to come to defend my position.

It was not possible to go, but I have since received — again through the State Department — a copy of the address delivered by Dr. Castillo on the occasion of this meeting which was held on Aug. 27, 1947, and published in the *Rivista Argentino de oto-rino-laringologia* (July-October, 1947).

It is a 45-page paper entitled, "Manuel Garcia, Inventor del metodo laringoscopica — Replica al Dr. Walter A. Wells."

From a literary point of view I admit it to be an excellent essay. It is marked by many high-sounding phrases and rhetorical flourishes.

It is replete with fulsome praise of the hero whose cause

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is championed and with stinging sarcasm, ridicule and invective directed against me for having the effrontery to question high authority and fixed opinion; but from the standpoint of facts and logic I find the effort lacking.

The burden of the argument seems to be that it is folly to deny Garcia to be the inventor of the laryngoscope, because he was so regarded by the laryngologists of his time, who knew all the facts as well if not better than an uninformed person such as myself at this late day. This is an argument that, of course, merely begs the question. He begins by quoting at great length from a paper on the subject of Garcia and his work, written in 1895 by Spanish laryngology Prof. A. G. Tapia.

I was interested to read that Garcia came of a distinguished family, that he was the son of a celebrated musician, that he became a celebrated teacher of music, that he wrote highly valued treatises on the art of voice production, that he taught famous pupils, etc., but I do not consider such matters as carrying much weight in deciding the question at issue.

Prof. Tapia includes in his monograph a complete review of the history of laryngoscopy, and he has not failed to mention Babington as one of those who deserves some credit in the evolution of the invention, but to be ranked simply in the class of precursor of him whom he regards as the real inventor, Manuel Garcia.

Dr. Castillo then reminds me with great gusto of the jubilee held in London in honor of Garcia, on which occasion he was acclaimed inventor of the laryngoscope by leading laryngologists from all over the world.

I did not need to be reminded of this jubilee, because I had referred to it in my original article; in fact, brought it into the foreground as giving point to the claim that Garcia had been anticipated in the invention for which he was being thus honored. To Castillo, however, this meant something different. He apparently regarded it a sort of holy synod whose decisions were to be held as sacrosanct, and he appar-

ently looks upon anyone who thinks otherwise as an abominable heretic.

He writes that Garcia was by it accorded "the homage of the official, scientific and medical world: kings, emperors and geniuses of medicine and art recognized in Garcia the hero that Wells now wishes to overthrow. Semon said that with his invention Manuel Garcia had erected for himself a memorial more durable than bronze and higher than the pyramids of the kings, but according to Wells, he was mistaken. According to him they were all mistaken. Perhaps Walter A. Wells is a genius superior to all mortals, the sole possessor of truth. By a stroke of fate, the homage was in London, and it was the English Babington's compatriots, the initiators of the homage, who would be accomplices in what according to him is an 'intellectual fraud.' Even the King of England would be an accomplice, as he received Garcia personally and presented him with the Victoria Cross. Good-bye to the traditional severity, equanimity and documentation of the Royal House." . . . "These men of science believed it was to Garcia that homage was due and they gave it without reservation. To think that they were all mistaken on the subject which they knew as well or better than we is an audacity and even — it is a harsh word — an insult."

From outbursts such as this, it is obvious that Dr. Castillo has worked himself up into a fine frenzy, which has caused him to lose his head. I shall, therefore, disregard his unfavorable personal allusion. I am convinced that he is a man of a sincere heart, animated by an excess of loyalty and an intense devotion to traditional ideals.

In another place referring to the evil of raising doubt, as in a case like that of Garcia, such a course, he says, tends to "overthrow the eternal values and the pride of men."

I am far from believing that such great matters are at stake in the investigation of the facts connected with the invention of the laryngoscope.

I feel that it is a subject that might without harm admit

of an honest expression of doubt. In the first place I am not alone in believing, as he infers, that Babington rather than Garcia deserves the honor of being recognized as the original inventor of the laryngoscope.

That claim was forcefully put forward by no less authority than the great English laryngologist, Sir Morell Mackenzie, who supported his claim by what I shall later show was irrefutable testimony.

The position taken by Mackenzie is confirmed by the published writings of two other leading English laryngologists of the time, Dr. J. D. Gibbs and Dr. Thomas Windsor — and more recently by Dr. Perry Goldsmith, of Canada, and Dr. C. Panconcelli-Calzia, of Germany. An article by the last named author will be found in *Der Medicinische Welt*, of March 30, 1935 (Vol. IX, p. 1752). It bears the title, "Der Erste Kehlspeigel, Babington Glottiscope (1829-1835)."

After a thorough review of the history, he concludes that the Babington so-called glottiscope was the first working mirror in the modern sense, and that the present prevailing view that we are indebted to Garcia for the discovery of the laryngoscope needs to be modified. Not Garcia, but Babington discovered the laryngoscope, but with this instrument Garcia was the first to see the vocal cord.

Dr. Panconcelli-Calzia was inspired to take up the subject because of a recent jubilee in honor of Johann Czermak for his part in the invention of laryngoscopy.

I wonder if he has been accused by his German confreres of being an iconoclast, a traitor to tradition and ruthless violator of the eternal verities.

I should also like to point out that there has been more than one instance in the history of medicine when the overwhelming opinion of the most enlightened men of an age proved later to be wrong and had to be reversed.

I would like to cite a conspicuous case that is very much to the point: There was a time when the whole medical world

was of the opinion that the honor of the discovery of general anesthesia lay between three men, Horace Wells, William Thomas Green Morton and Charles Thomas Jackson.

It was then only a question which man deserved most honor.

True, here and there mention was made of some obscure country doctor down in Georgia, who it was said had successfully performed a surgical operation under ether, but little attention was paid to this claim because no report of such an event had been made before any medical society, and there was no record of it in medical literature; but there were a few men interested in the truth who would not let the matter rest. They went to Georgia, interviewed witnesses and gathered testimony which convinced them that on March 30, 1842, Long removed a cystic tumor from the neck of a patient, under the influence of ether, and had subsequently used ether in other cases.

As this gave Long several years of definite priority, a crusade was begun by Dr. Marion Sims and others, which did not end until, as expressed in Mettler's recently published *History of Medicine* (1947), "universal recognition of Long as the discoverer of ether anesthesia has now been acknowledged the world over."

One might regard as a sort of official recognition the statue that was in 1926 placed in the United States capitol at Washington and bears the legend, "To the Memory of Dr. Crawford Williamson Long, the Discoverer of Sulphuric Acid Ether as an Anesthetic in Surgery."

The case of Dr. Babington presents a striking analogy to that of Dr. Long.

As in the case of the discovery of Long, Babington's invention was but little noticed by his immediate contemporaries, and its importance was not recognized until it reappeared as a new invention; whereupon the original inventor being ignored, the new inventor, if you please, receives all the honor. In both instances the recipients were obviously unaware that they had been anticipated.

The case differed in that in the former there had been an interval of only about two years; whereas Babington preceded Garcia by about a quarter of a century, and in that where, as the claim for Long was unsupported by written record, that for Dr. Babington is well documented. A report published in the medical journal of the time gave a definite description of the newly invented instrument and its method of use. This, as mentioned, was later supplemented by the testimony and exhibits supplied by Sir Morell Mackenzie, which proved — and this is the crux of the whole controversy — that the Babington laryngoscope was essentially the same as that later devised by Garcia.

I regret that Dr. Castillo has seen fit to construe my endeavor to do justice to Babington as a personal attack on Garcia. Referring to a speech the latter made at the London celebration in his honor, he exclaims, "you see, fellow laryngologists, Garcia did not try to appropriate anything; he was a correct and a strict man."

I have never for a moment thought otherwise, as must appear from the fact that in my original paper I took special care to say that I was certain that Garcia was quite unaware of Babington's previous invention. He was an able and honorable man and deserves credit for having made an independent discovery.

If it had been my privilege to attend the great celebration in his honor at London I, too, should have joined in the enthusiastic applause tendered by those present. I should certainly not on such an occasion have uttered a single word that would seem to detract from the general homage rendered that great and venerable old gentleman upon the hundredth anniversary of his birth; but now after more than 40 years have passed I do not think I ought to be accused of a lack of reverence because I proceed in a cold and dispassionate manner to review the facts of the case.

Controversy over the question of the credit due to an inventor in connection with an invention may go around in a circle

unless we first agree upon certain criteria by which one has to be guided in discussing the matter.

There are by common consent two chief criteria employed for establishing claim to original inventions: *viz.*, priority and practicality.

1. *Priority*: No one should have done exactly the same thing before.
2. *Practicality*: The invention must prove workable in practice.

In addition to these primary criteria, two others may be added because they are often invoked in the effort to properly appraise the merit of a particular person. These are:

- a. The usefulness of an invention as measured by the extent of its popularity.
- b. The conception in the mind of the inventor as to the applicability of his invention.

Let us briefly consider the case of Babington versus Garcia in the light of these criteria, both the primary and the secondary, giving some attention as we do to the criticism offered by Dr. Castillo.

- 1 *Priority*: No one should have done exactly the same thing before.

Manuel Garcia announced his invention of the laryngoscope in a paper presented to the Royal Society of London, May 24, 1855.

A paper announcing the same invention, under the name of "glottiscope" was read by Benjamin Guy Babington before the Hunterian Society of London, March 18, 1829, and a report of the same appeared in the *Medical Gazette* of London in the same year (Vol. III, p. 555).

Of course, if there were essential differences in the construction of the two instruments as described, or the methods of use as described, the criterion of priority would not apply,

especially if the differences could be interpreted as an improvement in favor of the one over the other; but the most careful reading of original records fails to show such differences.

Both authors used for introduction into the fauces small mirrors fixed at the end of a long shank, and both employed a hand mirror for reflection, utilizing the light of the sun for illumination. In both cases the instruction given as to method of use and precautions to be taken are the same. Neither of them used nor suggested artificial light or the concave reflecting head-mirror, two important later modifications.

It happens that the facts regarding the invention of Babington find full substantiation in the reports of contemporaries.

Sir Morell Mackenzie, in a paper before the Royal Medical Society, April 26, 1864, showed the exact instrument used by Babington, together with names of the instrument-makers.

At first Babington had used his throat mirror in combination with an ingenious tongue depressor, but in his later models the tongue depressor had been discarded and the laryngeal mirror used alone, as today. The mirrors were of an oval form and more like the modern type than others which had been more recently introduced.

Another laryngologist of this time, Dr. J. D. Gibbs, in a paper read before the Medical Society of London, Dec. 15, 1862, said that the instruments devised by Babington in the "simplicity of their construction and their utility were unequaled and not surpassed by many of more modern type."

The evidence, therefore, seems conclusive enough that the earlier instrument of Babington was in all essentials identical — certainly in no respect inferior — to that later devised by Garcia.

I challenge Dr. Castillo to produce any evidence to the contrary.

If it cannot be done, the decision on the score of priority belongs definitely to Babington.

With a very obvious inconsistency, Dr. Castillo elects to ignore the question of priority between Garcia and Babington and to discuss it instead as between Babington and his predecessors.

He criticizes me for not giving a more thorough review of the development of laryngoscopy and intimates that Babington had been anticipated by two workers of about the same period — namely, De la Tour, of Paris, and Senn, of Geneva.

Does he not realize that if this were true, by the same token Garcia had also been anticipated.

The truth is, the efforts of these two men have been examined critically by those who have given especial attention to the history of the subject and have been found wanting, as those of all the other precursors in one or the other of vital particulars.

Not one of them had succeeded in viewing the larynx.

Dr. Perry Goldsmith, in a paper which he read at a meeting of the American Laryngological, Rhinological and Otological Society in 1924 (*Trans.*, p. 345), entitled, "Historical Sketch of Direct and Indirect Laryngoscopy," specifically mentions as unsuccessful both the efforts of La Tour, of France, in 1825, and Senn, of Geneva, in 1827, and then goes on to say that in 1829 we actually had the first successful laryngoscope in the one invented by Dr. Benjamin Guy Babington, of London.

Dr. Panconcelli-Calzia, in the article previously mentioned, gave an interesting review of the development of laryngoscopy beginning with the ancient times, and he has included some curious illustrations of old instruments.

He stresses the fact that what had been labeled "specula" in the literature on the subject were not in fact mirrors. He also refers to the attempts of Senn and other immediate precursors, and concludes that it was the young English doctor, Babington, who produced the first working laryngoscope in the modern sense.

So stands the score of Babington on the priority issue, compared to predecessors as well as successors.

This brings me to the consideration of the other prime requirement for establishing a claim for invention.

2. *Practicality*: The invention must be proved to be workable in actual practice.

The idea of this requirement is to exclude an invention that is one in theory only. It must be proved workable by the test of experience. We must have evidence of successful use.

This criterion properly interpreted does not require that the successful use shall be at the hands of the inventor himself. It not infrequently happens that the test by trial and usage has been left to someone else — and there is no reason why it should not be; but the friends of Garcia apparently think otherwise. They make much over the well known repeated use by Garcia of his own mirror to study the action of the vocal cords.

I shall meet them on their own ground and prove that Babington made successful use of his own invention in his medical practice and that he continued to do so over a period of years.

Dr. Castillo intimates that Babington, on making trial of his apparatus, found it to be unsuccessful and abandoned it.

In his effort to support such a thesis, he makes (no doubt unconsciously) a wholly erroneous statement. He says that Dr. Babington in the year 1830, just after the invention, gave up medical practice for other occupation.

The truth is, Dr. Babington, in 1830, was just beginning his life of active medical practice which lasted for the next 25 years.

His most important opportunities for active clinical work began with his appointment as assistant physician on the staff of Guy's Hospital in 1837. He was made full physician at this institution in 1840, and he remained an active member

of the staff until his resignation in the year 1855; furthermore, there is positive evidence that he employed the instrument successfully over a long period of years.

Mackenzie stated that this was known to be true, and on the occasion of the reading of the paper he was supported in this by a Dr. Streeter, who asserted that to his personal knowledge Dr. Babington had continued using the instrument for many years.

Dr. Gibb said that in fact Dr. Babington had used the instrument on him personally about 10 or 12 years previously (1848-1850) at a place not over a hundred yards from their present place of meeting.

So much for the way in which the Babington side of the case measures up when subjected to the two primary criteria which in themselves alone are sufficient to determine a positive inventor's right.

Let us, however, also examine it in the light of criteria of secondary importance (*a* and *b*).

a. The usefulness of the invention as measured by its popularity.

This is really the criterion upon which the claim in favor of Garcia chiefly rests.

What happened, they exclaim, after Babington? Nothing. What happened soon after Garcia? Everything.

Great point is made of the fact that it was soon after the publication of Garcia's paper that laryngoscopy began to be widely used.

There is, however, a fatal fallacy in the argument. What became widely used and proved highly useful was not the invention of Garcia any more than it was the invention of Babington. It was the invention of Johann Czermak, who, by the addition of artificial illumination and a concave reflecting head-mirror, had devised a method of great practical value in examining and treating the throat.

Laryngoscopy had now entered upon a new stage, in which the name of Garcia was for a time completely forgotten.

A controversy of great bitterness ensued, not between Dr. Czermak and Garcia, but between Dr. Czermak and Dr. Ludwig Türck as to which of the two deserved the greater honor.

Türck had in fact begun using the instrument for medical purpose ahead of Czermak but without artificial light and the concave reflecting mirror, and because the winter of 1857 in Vienna was a dark and cloudy one, without much sunlight, he made little progress.

Czermak, borrowing one of Türck's instruments, found that with the improvement above mentioned, the examination of patients was greatly facilitated.

Türck in turn adopted the new method and began anew his clinical studies.

The first publications of these two authors appeared a month apart in the Spring of 1858, and their conflicting claims have ever since been a subject of dispute.

It appears that Czermak first employed artificial light and a reflecting concave mirror. He used the mirror by means of a projecting attachment held between the teeth. It is said that his pupil, Semiledder, first suggested fixing it to the forehead by means of a spectacle frame.

Türck by the new method made the greater progress in laryngological science; Czermak made the method popular by travel and demonstration in the several capitals of Europe.

The French Academy of Science, without deciding who deserved the greater honor, awarded a prize to each.

Garcia in those days was not in the picture at all.

When Czermak, in 1860, visited London the only name mentioned as his predecessor was the Scotch surgeon, Robert Liston, who, in his textbook on Surgery, published in 1840 (3rd ed., p. 417), had referred to the possibility of discovering growths in the larynx by such means.

Windsor, in a paper published in the *British and Foreign Med.-Chir. Review* (1863, III-1, p. 209), wrote: "It is of some importance that to each man, if not during his lifetime, at all events in the history of medicine, there should be assigned his due, and for this reason it may be well to correct an error into which all recent writers have fallen."

The error referred to was in giving Liston the credit for the discovery of the laryngoscope.

"The real discoverer, however, appears to be Dr. Benjamin Babington."

In his conclusion he wrote, "Dr. Benjamin Babington was the discoverer of the laryngoscope. At the same time, it must not be forgotten that to Garcia is due the merit of having first made an extended series of examinations in the healthy larynx. To Czermak must be awarded the praise of having diffused knowledge of the instrument and show its value in disease."

Evidently we need to modify the generally expressed view that it was Garcia who initiated the widespread use of the laryngoscope, which followed in a comparatively short time after the announcement of his discovery.

The method achieved popularity beginning with the efforts of Türck and Czermak in 1858.

Czermak borrowed his first mirror from Türck, who claimed that he had begun using a laryngoscope without any knowledge of the previous work of Garcia.

At any rate, the widespread use and the usefulness of the new instrument was in a field not envisaged by Garcia — and this brings us to the consideration of the other minor criterion (*b*).

- b. The conception in the mind of the inventor as to the applicability of his invention.

The two inventors in the case we are discussing had a defi-

nite idea of the purposes and possibilities of his invention, and these ideas were definitely different.

Garcia envisaged it as a means of studying the action of the vocal cords in producing tones, and he thought of it as a possible valuable aid in advancing the science of voice production and the art of singing.

Babington, on the other hand, as he has told us himself, was influenced because of the general interest of the time directed to diseases of the throat and devised his apparatus with the hope that it would offer a better way to study such diseases, and he used it exclusively for this purpose.

Judge for yourself which of the two had the more correct conception of the future scope and purpose of his invention.

The laryngoscope has become widely used and valuable in the field of medicine rather than music, and it ought to be a source of pride to all doctors that it was invented by a member of our profession. Laryngologists in particular ought to regard him as one of the patron saints of their specialty.

I regret that Dr. Castillo in his ardent favoritism for Garcia has seen fit to speak slightly of both the character and ability of Dr. Babington.

I happened to say that it was perhaps due to his innate modesty that Babington had not contested the claim made in favor of Garcia as the original inventor of the laryngoscope.

Dr. Castillo ridicules this idea and cites the fact that Babington entered into competition for the position on the staff at Guy's against Dr. Thomas Hodgkins (celebrated in medical history as father of Hodgkins' disease) and that he won and accepted, notwithstanding the fact that Dr. Hodgkins was an abler man. This sounds a little far-fetched.

That Babington was actually disinclined to insist upon his claims in regard to the invention, as it happens, we have direct evidence.

He was present by invitation at the meeting of the medical

society when Sir Morell Mackenzie proclaimed him as the inventor, when, instead of taking an assertive attitude, he merely remarked that he thought he had been praised too much.

That it may not be thought that the whole idea is one born of my own imagination, let me quote a paragraph from the National Dictionary of Biography.

"Those who knew Dr. Babington had the highest opinion of his ability by the proof he was generally respected but he hardly enjoyed the public reputation or gained the success which might have been considered his due. This was partly due to *his retiring and unambitious character* (the italics are our own), partly to his having entered the profession somewhat late in life.

"Referring to Babington's reputation as a man of remarkable versatility, Castillo makes a slurring remark on his ability.

"He was, he says, only a dabbler who left behind no great lasting achievement."

In reply to these uncalled for aspersions, I shall merely call attention to the following facts derived from authentic biographical sources. Babington as a young man, even before the age of 20, had gained a high reputation as an Oriental scholar. He deciphered hieroglyphic inscriptions which had baffled others, and he translated several works from the little known Tamil dialect. One of these has recently been republished in this country.

Obliged to leave India on account of his health, he returned to London to take up the profession of his distinguished and much beloved father, Dr. William Babington.

Specializing at first in the new science of biochemistry, he made important contributions — especially in the subject of chemistry of the blood.

Terms introduced by him in this specialty are still in use today.

After a career of 25 years as a clinician and teacher at Guy's Hospital and as a confrere of such men as Bright, Addison and Hodgkins, he gave up the active practice of medicine and devoted his energies to the advancement of public health.

He was the founder and, for a number of succeeding years, president of the Epidemiological Society and he was one of the foremost pioneers of modern state medicine.

Whether or not any of these achievements shall be accounted such as to obtain for him lasting fame has not been our problem.

That has been directed rather to prove that Benjamin Guy Babington rather than Manuel Garcia deserved the honor of being recognized as the original inventor of the laryngoscope.

The object has been to do justice to Babington, not to disparage Garcia.

The distinguished singing teacher deserves without doubt the honor of having independently invented the same method and the honor having been the first by this method to view the vocal cords, and not only of other persons but of himself (autolaryngoscopy); but the credit of being the original inventor, we stoutly maintain should go to Babington.

SUMMARY.

All available evidence has been examined and considered with strict regard for criteria accepted as proper for determining conflicting rights in such cases.

Priority for Babington is definitely established by published record of his invention which sufficiently describes its construction and method of use.

The vital point is that the priority claim is based upon the fact that it was in every essential the same as the later announced invention of Garcia.

That it was a workable invention and that it was success-

fully used by Babington over a period of years is also firmly established by the recorded testimony of several contemporaries.

It is urged in favor of the claim of Garcia that it was soon after the announcement of his invention that it became to be widely used.

The fallacy here is that what came to be widely used was an essentially different invention.

The addition of two new features, *viz.*, the use of artificial illumination and the reflecting concave head-mirror rendered it an instrument of great usefulness in the practice of laryngology. With this development a controversy over priority arose in which the name of Garcia did not appear.

It was entirely between Johann Czermak and Ludwig Türck, of Vienna.

Czermak was apparently chiefly responsible for improvement in technique, and Türck for its application to the progress of laryngology, although this question, which of the two deserves the greater honor, has never been fully settled.

Attention is called to the fact that the ultimate wide use and great usefulness of the laryngoscope was not in the field of voice culture but in the field of medicine, for which it was designed and used by Babington.

COMPLETE UNIT FOR USE OF NASOPHARYNGEAL RADIUM APPLICATOR.

HARRY NEIVERT, M.D., D.Sc., and LEO A. KALLEN, M.D.,
New York, N. Y.

This compact outfit contains all the necessities pertaining to treatment with, and cleansing and housing of the nasopharyngeal radium applicator. It affords economy of space, simplicity of handling and adequate protection in storage.

According to instruction from the Radium Chemical Co., the container now in use, which provides one-inch radial protection, was designed for transportation only. This is inadequate against emanation of harmful rays. For adequate safety in clinical storage, the 50 mg. capsule requires a minimum of a three-inch radial thickness of lead, necessitating a mass at least six inches in all dimensions. It is self-evident that the minimal weight of such a mass in relation to space occupied will be in the form of a globe. Adequate protection against vertical emanation through the open area occupied by the shaft of the applicator requires a $1\frac{1}{2}$ -inch thickness of lead in the vertical plane. This is provided by a lead cap, $1\frac{1}{2}$ inches thick, surmounting a lead tube which extends from the globe. The tube is 4 inches long, $1\frac{1}{4}$ inches in outside diameter, with a $\frac{1}{4}$ -inch wall. The entire unit has the appearance of a decanter fitted into a rectangular wooden case. The cap is also specially designed for use in cleansing the applicator.

The cover of the case houses the time clock and cotton container. The clock is permanently affixed in its space and is not removed for use. The case proper contains, besides the unit of lead, bottles for solutions, etc. One bottle contains a lubricant (0.5 per cent phenol in liquid petrolatum), which also reduces the adherence of mucus to the applicator. The

Editor's Note: This ms. received in Laryngoscope Office and accepted for publication, Sept. 15, 1948.

other bottles contain tincture of green soap and alcohol, respectively.

The procedure is very simple. Anesthetize the nose. Place the outfit near the patient (who is preferably in recumbent position). Open the lid of the case. Remove the lead cap and

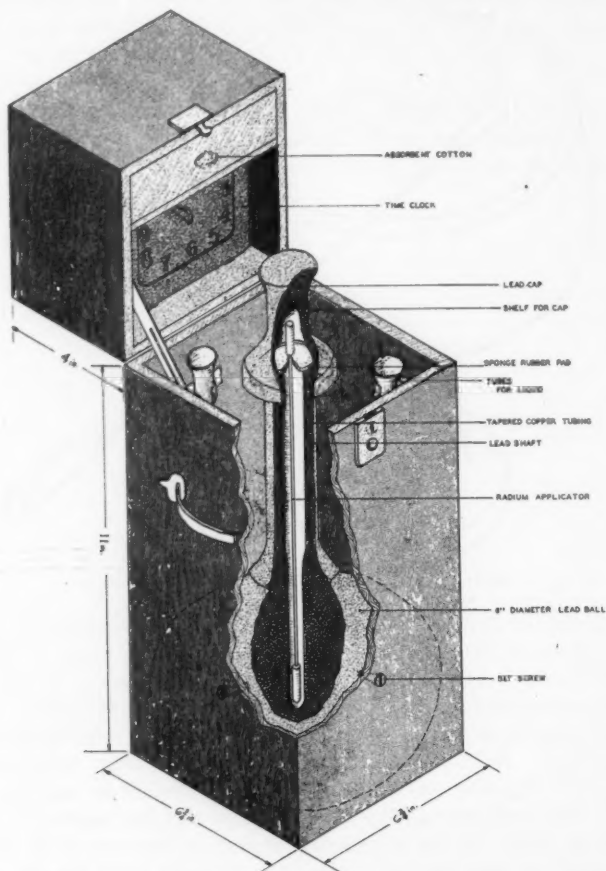


Fig. 1. Isometric drawing of Neivert unit for nasopharyngeal radium applicator.

in inverted position place it on the corner shelf inside the box. Withdraw the applicator. Dip it into the lubricant, allow the excess to run off, and introduce it into the nose; adjust it so as to make contact with the Eustachian opening and fix it in this position by an adhesive strip from the opposite cheek.



Fig. 2. Inverted cap used to clean applicator.

Then set the timer for 12 minutes. Before termination of the treatment of the two sides (12 minutes each) place a large wad of cotton saturated with tincture of green soap (or other cleanser if preferred) into the cup of the cap especially designed for that purpose. At end of treatment withdraw the applicator. Hold the cap in left hand (or it may remain on the shelf if preferred) and cleanse the applicator by passing it back and forth across the cotton. Then dip the applicator in alcohol, shake off the excess and replace it into the lead unit. Discard the used cotton, replace the cap and close the lid.

555 Park Avenue.

CORRECTION.

In the article entitled, "The Articulation Area and the Social Adequacy Index for Hearing," in the August issue of *THE LARYNGOSCOPE* (Volume 58, pages 761-778), a footnote acknowledging the assistance of the Office of Naval Research was inadvertently omitted by the author. Actually, most of the experimental studies on which the paper was based and the preparation of the paper itself were carried out under Contract N6onr-272 between the Office of Naval Research and Central Institute for the Deaf.

**THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL
AND OTOLOGICAL SOCIETY, INC.**

The 1949 Section Meetings will be held as follows:

Eastern Section—Jan. 7, 1949, Boston, Mass.

Southern Section—Jan. 10, 1949, Washington, D. C.

Middle Section—Jan. 17, 1949, Iowa City, Iowa.

Western Section—Jan. 29-30, 1949, Los Angeles, Calif.

The midwinter Council Meeting will take place in New York City on Jan. 8, 1949.

The annual meetings of the Triological Society and the Broncho-Esophagological Association will be held concurrently at the Drake in Chicago on April 18, 19 and 20, 1949. A joint meeting of these two societies will take place Tuesday morning, April 19. On the other days the Triological Society will meet in the mornings and the Bronchoscopic Society in the afternoons.

We also call your attention to these dates and places:

American Board of Otolaryngology—May 11-14, 1949, New York City.

American Laryngological Association — May 16-17, 1949, New York City.

American Otolological Society—May 18-19, 1949, New York City.

In order to facilitate the coordination of national meetings, the Bronchoscopic, the Otolological, the Laryngological and the Triological Societies are considering a five-year plan of dates and places. By adoption of such a scheme we hope to reduce the traveling mileage and the amount of time away from our offices. For additional information, write to Dr. C. Stewart Nash, Secretary, 708 Medical Arts Building, Rochester 7, N. Y.

FEB. 26, 1948.

**HEARING AIDS ACCEPTED BY THE COUNCIL ON
PHYSICAL MEDICINE OF THE
AMERICAN MEDICAL ASSOCIATION.**

**Aurex (Semi-Portable) ; Aurex Model C-B, Model C-A, Model
F and Model H.**

Manufacturer: Aurex Corp., 1117 N. Franklin St., Chicago, Ill.

Beltone Mono-Pac; Beltone Harmony Mono-Pac.

Manufacturer: Beltone Hearing Aid Co., 1450 W. 19th St., Chicago, Ill.

Dysonic Model 1.

Manufacturer: Dynamic Hearing Aids, 43 Exchange Pl., New York 5,
N. Y.

Electroear Model C.

Manufacturer: American Earphone Co., Inc., 10 East 43rd St., New
York 17, N. Y.

Maico Type K; Maico Atomeer.

Manufacturer: Maico Co., Inc., North Third St., Minneapolis, Minn.

Mears Aurophone Model 98.

Manufacturer: Mears Radio Hearing Device Corp., 1 W. 34th St., New
York, N. Y.

Microtone T-4 Audiomatic.

Manufacturer: The Microtone Co., 4602 Nicollet Ave., Minneapolis,
Minn.

**Otarion Model A-1; Otarion Model A-2; Otarion Model A-3;
Otarion Models A-4 J and S; Otarion Model E-1.**

Manufacturer: Otarion Hearing Aids, 448 N. Wells St., Chicago, Ill.

**Paravox Models VH and VL; Paravox Model XT; Paravox
Model XTS.**

Manufacturer: Paraphone Hearing Aid, Inc., 2056 E. 4th St., Cleveland,
Ohio.

**Radioear Masterpiece; Radioear 45-CM; Radioear Model
45-M-magnetic air conduction receiver; Radioear Model
45-M-magnetic bone conduction receiver.**

Manufacturer: E. A. Myers & Sons, 306 Beverly Rd., Mt. Lebanon, Pitts-
burgh, Pa.

Ravox (Semi-Portable).

Manufacturer: Zenith Radio Corp., 6001 W. Dickens Ave., Chicago, Ill.

Silver Micronic Hearing Aid.

Manufacturer: Micronic Corp., 101 Tremont St., Boston 8, Mass.

Solopak Hearing Aids.

Manufacturer: Allen-Howe Electronics Corp., 150 Main St., Peabody, Mass.

Sonotone Audicles No. 530, No. 531 and No. 533; Sonotone Model 600; Sonotone Model 700.

Manufacturer: Sonotone Corp., Elmsford, N. Y.

Telex Model 22; Telex Model 612; Telex Model 900; Telex Model 1020; Telex Model 1550.

Manufacturer: Telex, Inc., Minneapolis 1, Minn.

Trimm Vacuum Tube No. 300.

Manufacturer: Trimm, Inc., 400 W. Lake St., Libertyville, Ill.

Unex Model "A."

Manufacturer: Nichols & Clark, Hathorne, Mass.

Vactuphone Model 3.

Manufacturer: Allen-Howe Electronics Corp., 150 Main St., Peabody, Mass.

Western Electric Orthotronic Model 125; Western Electric Model 63; Western Electric Model 64; Western Electric Models 65 and 66.

Manufacturer: Western Electric Co., Inc., 120 Broadway, New York 5, N. Y.

Zenith Radionic Model A-2-A; Zenith Radionic Model A-3-A; Zenith Radionic Model B-3-A; Zenith Model 75.

Manufacturer: Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.

DIRECTORY OF OTOLARYNGOLOGIC SOCIETIES.

AMERICAN OTOLOGICAL SOCIETY.

President: Dr. Marvin F. Jones, 121 E. 60th St., New York 22, N. Y.
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Meeting: New York, N. Y., May 18-19, 1949.

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President: Dr. Frederick T. Hill, Professional Bldg., Waterville, Me.
Secretary: Louis H. Clerf, 1530 Locust St., Philadelphia 2, Pa.
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Annual Meeting: Chicago, Ill., Hotel Drake, April 18-20, 1949.

SECTION MEETINGS.

Eastern—Boston, Mass., Jan. 7, 1949.
Southern—Washington, D. C., Jan. 10, 1949.
Middle—Iowa City, Iowa, Jan. 17, 1949.
Western—Los Angeles, Calif., Jan. 29-30, 1949.

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Meeting: New York, N. Y., May 11-14, 1949.

**PAN AMERICAN ASSOCIATION OF OTO-RHINO-LARYNGOLOGY
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Secretary: Dr. Chevallier L. Jackson, 255 S. 17th St., Philadelphia, Pa.
Second Pan American Congress of Oto-Rhino-Laryngology and Broncho-
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Secretary of Section on Otolaryngology: Dr. Alden H. Miller.
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Time: 6 P.M., fourth Monday of each month from September to May,
inclusive.

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